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15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

CHRONOLOGICAL AND DESCRIPTIVE INDEX

OF

PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING

THE ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

For the Year 1874.

Printed and Publiſhed by Order of the Commiſſioners of Patents,

UNDER THE

ACT of 15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

BY BENNET WOODCROFT, F.R.S.,
CLERK TO THE COMMISSIONERS OF PATENTS.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
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SOUTHAMPTON BUILDINGS, HOLBORN.
1875.

PREFACE.

PREVIOUS to the year 1867 the Abridgments of Specifications were published in classes only; and after the publication of the first volume of a class, bringing the Abridgments down to a particular date, considerable time necessarily elapsed before the appearance of the second part or continuation of the class. To obviate the inconvenience thus occasioned, the Commissioners of Patents made the following rule:—

> After the 31st day of December 1866, every applicant for Letters Patent shall deliver at the Office of the Commissioners, with his provisional specification, or (when a complete specification is filed with the petition and declaration) with his complete specification, an abridgment, in duplicate, under his hand or the hand of his agent, of such provisional or complete specification. The abridgment must set forth the name of the applicant, the title of the invention, and describe, in as short a manner as possible, the features of novelty which constitute the invention. The abridgment and the copy thereof must be written upon sheets of foolscap paper, and upon one side only of each page, leaving a margin of one inch and a half on the left-hand side of the page.

The Commissioners also directed that the Abridgments so delivered should be printed and published in the following manner, as explained in their Report to Parliament for the year 1866:—

> " These abridgments will be printed and published in quarterly volumes after the expiration of " the six months' protection. Thus the abridgments delivered at the office in the quarter ending " 31st March will be ready for printing in the quarter ending 30th September, and the volume will " be published in the ensuing quarter. The volumes will be of the same size as the chronological, " alphabetical, and subject-matter indexes (imperial 8vo.), and constitute in fact a fourth kind of " index, viz., a descriptive index in a chronological form. It is also intended to publish these " abridgments from time to time in classes, according to the plan which has been in operation from " the year 1856."

The publication of the Descriptive Index accordingly commenced in 1867. In the volumes for the years 1867 and 1868, the correct title of the Invention is prefixed to each Abridgment, and also the name of the communicator, when the invention has been communicated from abroad, and a notice if Letters Patent have not been granted or are void for want of a Final Specification. The Abridgment itself is printed exactly as furnished by the applicant for Letters Patent; no attempt being made to correct errors in spelling or grammatical construction, or to supply words which have been omitted (except in cases where the words omitted from the original Abridgment are to be found in the copy).

In the volume of this Index for the year 1869, all the information previously furnished in a separate form by the Chronological Index was given (as well as an Alphabetical Index of Names); the title was changed to "Chronological and Descriptive Index of " Patents applied for and Patents granted;" and the Chronological Index ceased to appear as a distinct publication.

In consequence of the receipt of a memorial signed by a large number of patentees, manufacturers, and literary and scientific men, the Commissioners of Patents decided that the Abridgments delivered after the 1st January 1871 should be published weekly (instead of quarterly), with Indexes of Persons and Subjects. The Chronological and Descriptive Index for 1871, with Indexes of Names and Subject-matter, accordingly commenced in a weekly form on the 14th July 1871. The Indexes for the years 1872, 1873, and 1874 have been printed and published in like manner. The notices which were prefixed to the Abridgments in cases where Letters Patent had not been granted or were void for want of a Final Specification have been discontinued, as, on account of the early publication of the Abridgments, the information could not in every case be given; but this information will be found in the copies of the Specifications which are subsequently printed. In the body of the work the Abridgments of the Provisional and Complete Specifications are published in regular numerical order in the week after the expiration of the term of *six months* from *the date of application*. But each weekly number has an appendix, containing the Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications just received. These Abridgments are subsequently printed in the body of the work in their proper places, in order to preserve the numerical and chronological arrangement of the book. The Indexes of Names and Subject-matter refer to the Abridgments in the appendixes, as well as to those in the body of the work. In the indexes of each successive number for the years 1871, 1872, and 1873 all the previous indexes were incorporated until the end of the year, and then with the last No. [52] the complete Alphabetical and Subject-matter Indexes for the year were published, to be bound with the fifty-two weekly parts in one volume. This practice has been still followed with the Subject-matter Index for the year 1874, but with the Index of Names only to the publication of the 31st No., when the Alphabetical Index for the whole year was published The appendixes are not to be bound with the volume, as the Abridgments which they contain ultimately appear in the body of the work.

Beside the title-page of this volume of the Chronological and Descriptive Index, there are separate title-pages for the Alphabetical and Subject-matter Indexes, so that they may be bound up independently, if preferred.

B. WOODCROFT.

July, 1875.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 1 to January 3, 1874.

A.D. 1874, January 1.—No. 1.

COTTER, William, of Hoxton, in the county of Middlesex, auctioneer.—" A new or improved telescopic " or folding combined bedstead and air bed, part of which invention is applicable also to other purposes."

The Specification of this invention describes a bedstead with framing of telescope tubes and bed of air tubes formed with solid ends, the air being let in as the bedstead is expanded, and the pressure of air being obtained by forcing the ends of the bedstead together. The tubes are applicable to other purposes.

A.D. 1874, January 1.—No. 2.

FOWLIE, James Fraser, of Barrow-in-Furness, in the county of Lancaster, ship and insurance broker.—" Improvements in harness or arrangements used for traction by animal power, and when carrying loads " upon animals."

The object of the invention is to equalize and regulate the strain and reduce the jerk and concussion to which horses and other draught animals are subjected when drawing ploughs, harrows, carts, wagons, and other vehicles, or when employed in other tractive purposes, and also when carrying loads; and the invention consists in introducing between the animal and the plough, harrow, cart, wagon, or other vehicle, an elastic arrangement, which may be formed by means of metal, india rubber, or other springs, or by other elastic substances. The elastic arrangement is introduced into the harness, or is attached to the plough, harrow, cart, wagon, or other vehicle to be drawn, so that the tractive strain of the animal and the concussion caused by the plough, harrow, cart, &c., coming in contact with any substance impeding the draught, as also the vibration from irregular loading, on the animals' back, will pass through such arrangement, which will thus equalize the strain and modify the jerks and concussions. In carrying loads by animals, a similar elastic arrangement to that above described for tractive purposes is introduced into the harness or connections between the animal and the load which it carries.

A.D. 1874, January 1.—No. 3.

LAMONT, James, of the city of Glasgow, in the county of Lanark, North Britain, plumber.—" Improvements in the manufacture of illuminating gas, and apparatus or mechanism connected therewith."

This invention consists in the construction of a portable apparatus for the manufacture of illuminating gas from crude mineral and fish oils, applicable for supplying with gas such places as are not in connection with public gas works. The retort is made in the form of a shallow close vessel, and sunk into the top of a close heating stove, so as to form the cover over the fire grate below, which is made to burn dross. The oil is fed into the retort by a small pipe from a cistern above, fitted with a dip bend or oil trap, led off from the retort by a larger pipe down to a liquid trap at the bottom of the purifier, where after escaping up through the liquid it passes up through perforated trays with a coating of lime and oak sawdust on them, from the top of which purifier it is finally led off by another pipe up through the bottom of and up into the gasometer. The gasometer is of the dry collapsing class, and counterweighted by chains and pulleys to the pressure desired to be given to the gas, which is discharged through service pipes, all otherwise in the usual manner.

A.D. 1874, January 1.—No. 4.

DUCKETT, George, of Longridge, in the county of Lancaster, and **MERCER, Thomas**, of the same place.—" Improvements in size and the method of sizing."

The great advantages this preparation has over all others, are, that it is simple and inexpensive; the sizing frame will not require stopping so often, and when so stopped will not leave the hard stiff brown places so common. It will save both labour and sixty per cent. in cost.

A.D. 1874, January 1.—No. 5.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Charles Keniston, of Somerville, county of Middlesex, Massachusetts, United States of America.*)—" Improvements in " uniting leather work, in the fastenings for that purpose, in the mechanism for making such fastenings, " and in the mechanism for driving said fastenings, chiefly applicable to boots and shoes."

This invention describes a peculiar staple for uniting leather work; a seam for boots and shoes and other leather work made for such staples; a staple blank or ribbon; a combination of mechanism for forming the staple blank or ribbon; and mechanism and details for feeding the ribbon, cutting the staples therefrom, and driving them into the work to be united.

A.D. 1874, January 1.—No. 6.

GOTTHEIL, Robert, of the International Patent Office, 126, Linden St., Berlin, Prussia, civil engineer. —(*A communication from Gustav Oesten, of Berlin, Prussia, mechanical engineer.*)—" Improvements in the " apparatus for measuring the heat of fluids passing through pipes."

This invention relates to apparatus for indicating the heat of fluids passing through pipes.

In the course of the pipe is a circular casing opening tangentially to the pipe. In this casing is mounted a wheel with vanes mounted on spindles, so that they can turn more or less obliquely to the plane of the wheel, these spindles being geared to a spiral spring made of two metals having different degrees of expansion when subjected to heat. The wheel is geared to a counter. When fluid passes along the pipe it impinges on the vanes and causes the wheel to rotate more or less rapidly according as the vanes are more or less inclined to the plane of rotation. The spiral spring and its gearing with the vanes is so adjusted that the greater the heat to which the instrument is subjected, the more the vanes are inclined by the action of the spring, and consequently the greater is the speed of rotation. The counter thus registers the product of the quantity of fluid passing along the pipe by its heat, or if the quantity be uniform it registers the number of units of heat transmitted along the pipe.

In a system of steam or water heating pipes, by applying an apparatus at each end, and comparing the indications, the quantity of heat given off may be ascertained.

A.D. 1874, January 1.—No. 7.

PARKER, John, of No. 71, Albert Street, Darnall, near Sheffield, in the county of York.—" Improvements " in apparatus for rolling railway carriage and other wheel tyres."

In rolling the tyres for railway carriage and other wheels it has been usual for the roll which gives form to the flange or outer diameter of the tyre to be provided with two fixed collars, one on each side of it, such collars extending so as to embrace between them the counter or back roll.

According to this invention, in place of applying both these controlling collars on one roll, one of them is applied on each, by which a much smaller back or counter roll may be employed, and with the same facilities for variation in thickness or substance operated upon.

By these means the necessity for the "cogging down" or "becking" under the hammer required by the present practice is avoided.

A.D. 1874, January 1.—No. 8.

LEON, Levy, of Thornhill Road, Barnsbury, in the county of Middlesex, curiosity dealer.—" An improved " fire-escape or apparatus for saving life in case of fires, applicable also for facilitating descent over ships' " sides, and for other similar purposes."

This apparatus consists of one or more arms or brackets furnished with arrangements for connecting it with a window sill or ship's bulwark, and pulleys or drums with ropes or the like, which may carry seats or stands. The brackets may be hinged so as to slew or swing, and there is a friction break to retard, control, or steady the motion.

A.D. 1874, January 1.—No. 9.

BECKER, Lewis Matthews, of Peckham, in the county of Surrey, engineer.—" Improvements in " shuttles, spools, and bobbins, for sewing machines and other purposes."

The chief features of novelty in this invention are:—I. Making the shuttles without any internal springs, latches, or other such contrivance, but with an orifice or orifices to receive a spindle removeable at will. Either the spindle or the bobbin may revolve. II. So making the spools in parts, detachable at will, that they may be quickly separated to receive the ready wound sewing material, and be as readily placed together again. III. Making the spindles of shuttles with a fast and loose collar, a pin, or other equivalent contrivance, so that the bobbin may be quickly placed in position upon the spindle, or removed and another substituted. IV. Making the bobbins in the form of tubes provided with end-pieces or collars in such manner as to facilitate their speedily being placed in position or removed; and, lastly, in peculiar arrangements for facilitating the printing or stamping with numbers, letters and designs the spools or bobbins.

A.D. 1874, January 1.—No. 10.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Charles M. Nes, of York, Pennsylvania, United States of America.*)—" Improvements " in the manufacture of steel."

This invention relates to the manufacture of steel, either wrought or cast, from ordinary pig or cast iron, by an admixture with the same pig iron made from magnetic silicide of iron ore, commonly called codorus ore, or from said ore mingled with ordinary hematite or other good iron ore.

A.D. 1874, January 1.—No. 11.

BARLOW, Henry Bernoulli, of Manchester, in the county of Lancaster, patent agent.—(*A communication from John Dobson and James Dobson, both of Philadelphia, in the state of Pennsylvania, in the United States of America.*)—" Improvements in apparatus for delivering and drawing long fibred wool after " carding."

This invention consists in collecting the slivers from a row of wool carding engines on to an endless belt travelling in a trough and then causing the united slivers to pass between three pairs of rollers which elongate the slivers and deposit them into a can or other receptacle.

A.D. 1874, January 1.—No. 12.

ABBOTT, Walter, of Deptford, in the county of Kent.—" Improvements in ships' boats."

Air cases are applied outside the ordinary lines of a ship's boat, or partly outside and partly inside the boat to increase its buoyancy. The keel and keelson are made hollow with openings to the external water which passes into a tank at the bottom of the boat to serve as ballast and impart increased lateral stability, fresh water tanks being also provided on either side of said tank.

A.D. 1874, January 1.—No. 13.

JENSEN, Peter, of No. 89, Chancery Lane, in the county of Middlesex.—(*A communication from Joseph Duval, of Saint Joseph, Canada.*)—" Improvements in breech-loading fire-arms."

This consists :—

First, of an arm wherein the hammer cock or other appliance for operating the needle is contained in the breech.

Second. Working the needle by a V spring instead of spiral spring, and using the V spring for needle and cock spring.

Third. The breech block rises automatically, after the introduction of a new cartridge, sufficiently to keep the new cartridge in place.

Fourth. A safety bolt under the trigger to prevent same being operated.

Fifth. In means provided for rendering the arm useless in case of falling into hands of an enemy as well as in the means provided for cleaning the arm.

A.D. 1874, January 1.—No. 14.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Stanislas Alexandre Louis Berthier, a person resident at Rue de Rivoli, 152, Paris, France, merchant.*)—" A new and " improved printing press."

The invention consists of three main parts: the frame supporting the setting of types together, the upper frame, and the compressing plate being one with the latter.

A.D. 1874, January 1.—No. 15.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Stanislas Alexandre Louis Berthier, a person resident at Rue de Rivoli, 152, Paris, France, merchant*).—"A new and improved copying press."

The invention consists of two metal or wooden, or other suitable material, plates, between which the copy book is placed, and compressed by means of a lever provided with an eccentric boss.

A.D. 1874, January 1.—No. 16.

DENY, Louis, of Paris, in the Republic of France.—"An improved mode of forming strainers, and an improved tool for preparing perforated metal plates for the same."

In this improved mode of forming, straining, or filtering surfaces the inventor takes a sheet of metal of the desired thickness, and with a tool having a sharp or chisel shaped edge punches or indents the metal to about the depth of the thickness of the sheet.

A.D. 1874, January 1.—No. 17.

BUCHHOLZ, Gustavus Adolphus, of Nottingham, in the county of Nottingham, engineer.—"Improved apparatus for obtaining motive power."

The improved apparatus consists of an overshot water wheel, which is enclosed in a case to which the water is admitted from a reservoir placed at any convenient altitude above, and novel devices for returning the water to the reservoir from whence it will descend again to act a second time in the water wheel.

A.D. 1874, January 1.—No. 18.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from La Société Camlon et Compagnie, of Paris, in the Republic of France.*)—"Improvements in the treatment and preservation of textile materials and fabrics, wood, ligneous substances, and paper, and in the dressing or product employed therefor."

This invention has for its object a new product intended for the dressing, preservation, and rendering impermeable of textile materials either in the raw or manufactured state, wood, ligneous products, and the various kinds of paper.

In order to obtain this preparation, (which it is proposed to designate "Guignet's dressing") a metallic soap insoluble in water, but sufficiently soluble in hydrocarbons or other volatile liquids, is first produced by double decomposition by the aid of a solution of a metallic salt, such for example as sulphate of alumina, of iron, or of copper, and of a soluble soap such for example as Marseilles soap, or resinous soaps. These substances are mixed together by powerful stirring or agitation either in a cold or warm condition. When treated warm, the insoluble soap in the water generally melts and comes to the surface and may be readily skimmed off, but when the operation is performed in the cold condition, the separation is obtained by simple filtration. The soap which is insoluble in water is dissolved for use in a light oil of tar, petroleum, or other volatile hydrocarbon, in in essences, sulphuret of carbon or any other solvent, which does not leave any residuum by evaporation.

In employing this preparation it is frequently desirable to heat it slightly in order to render it perfectly fluid. The threads, ropes, fabrics, or other materials which it is required to treat are first well dried and then immersed therein, or the preparation may be applied in any other suitable manner. The solvent evaporates by exposure to the open air, leaving the material under treatment coated and thoroughly permeated with the insoluble metallic soap, or the evaporation may be effected in distillatory apparatus so as to recover the solvent for reutilization.

Any other substances may be added to the solvent employed in order to modify the color and properties of the preparation. The insoluble soaps may be dissolved in small quantities in drying oils, and thus serve for the preparation of a paint or coating possessing valuable preservative properties.

A.D. 1874, January 2.—No. 19.

JOHNSON, Samuel Henry, of Lea Bank Works, Stratford, in the county of Essex, manufacturing chemist.—"Improvements in the method of and apparatus for separating free sulphur from substances with "which it is mixed."

This Provisional Specification describes certain improvements in the method of and apparatus used for separating free sulphur by means of certain chemical agents from substances with which it is mixed. Also modifications and improvements in the necessary apparatus therefor.

A.D. 1874, January 2.—No. 20.

DUDGEON, Arthur, of 22, Great George Street, Westminster, London, S.W., and of 163, Great Brunswick Street, Dublin, engineer.—"An improved method of utilizing the heat of furnaces in the generation "of steam."

The feature of this invention consists in the combination of a steam boiler or boilers with furnaces for roasting, calcining, or smelting ores of metals, also with furnaces for calcining stones or other materials used in the manufacture of artificial cements, and with kilns for calcining lime and other stones, and for burning bricks; also with ovens for the carbonization of coal, wood, and peat, and with ovens and furnaces for the distillation of oils and other substances from woods, shales, or other materials.

A.D. 1874, January 2.—No. 21.

GOTTHEIL, Robert, of the International Patent Office, 126, Linden Str., Berlin, Prussia, civil engineer. —(*A communication from Ernest Mehl, director of the Augsbourg Worsted Yarn Mill Company, at Augsbourg.*) —"Improvements in apparatus for washing, opening, drying, and oiling wool, and for regulating the supply "of soap solution, and oil thereto."

This invention has for its object the supply of a regulated quantity of soap to the wool to be operated on in wool washing apparatus; the uniform opening out of the washed wool; the drying of the same; and the charging of it uniformly with a regulated quantity of oil, the various operation being effected in sequence in a combined apparatus.

For supplying the soap solution to the washing apparatus a small trough or spoon is mounted on an arm on a rotating shaft, whereby the spoon is made alternately to dip into the soap solution contained in a trough beneath the shaft, and by coming in contact with a moveable plate at the side of the trough, to deliver its contents into the washing apparatus. By moving the said plate so that the spoon does not come in contact therewith, the supply of soap solution is stopped. After passing through the washing apparatus and the squeezing rollers at the end thereof, the wool passes on to a travelling band upon which is pressed a roller caused to move considerably faster than the squeezing rollers, so that the wool is thereby separated into small flocks which are delivered by the travelling band into a revolving wire gauze cylinder having rows of pegs, by which the wool is alternately raised up as the cylinder rotates, and is then allowed to fall to the bottom of the cylinder again. The cylinder being slightly inclined from the horizontal position, the wool is made by the above means to travel slowly from the inlet end to the delivery end of the cylinder, and as it passes through, it is subjected to the drying action of heated air passing up through the cylinder. At the delivery end of the cylinder the wool falls on to a travelling band which conveys it between two rollers supplied with a regulated quantity of oil by apparatus of the same construction as that for supplying the soap solution.

A.D. 1874, January 2.—No. 22.

DUDGEON, Arthur, of 22, Great George Street, Westminster, London, S.W., and of 163, Great Brunswick Street, Dublin, engineer.—"Improvements in the manufacture of peat for fuel."

The features of this invention are the thorough draining of the bog before treatment; an improved arrangement of inclined tramways; a machine for breaking up the peat in its passage to the disintegrator; a special form of disintegrator with the introduction of steam and waterpipes into the centre of same; a moulding machine of novel design; a special form of trays and wagons for the conveyance of the peat; a novel mode of construction of sheds with passage ways, racks, and tramways; and the heating (without any, or with little cost for fuel) the sheds by steam or waterpipes taken from steam boilers combined with furnaces, ovens, or lime kilns.

A.D. 1874, January 2.—No. 23.

ROBINS, WILLIAM BURNET, of 133, Ladbrooke Grove, in the county of Middlesex.—"Improvements in "hydronettes, hand pumps, and syringes."

The improvements described in this Provisional Specification relate—

1st, to the construction of the piston.

2nd, to the construction of inlet valves.

3rd, to the construction of combined rose and jet nozzles.

A.D. 1874, January 2.—No. 24.

CURTIS, FREDERICK, of Boston, in the county of Suffolk, and state of Massachusetts, of the United States of America.—(*A communication from Thomas Scott Williams and Phillip Sidney Page, residents at Boston, in the county of Suffolk, and state of Massachusetts, United States of America.*)—"Improvements in "lamps."

The claims to this Complete Specification are,—

1st. The case or socket A in combination with a railroad-car lamp or lamp fountain C, substantially as and for the purpose specified.

2nd. The spring B or equivalent guides or bearings arranged between the lamp or lamp fountain, and attached to either, substantially as and for the purpose set forth.

3rd. Projections C arranged in the case or socket A substantially as and for the purpose specified.

4th. The frame F^1, substantially as and for purposes stated.

5th. In combination with the open frame F^1 and globe J^1, the spring clasp N^1 and hinge K^1, substantially as and for purposes stated.

6th. Hinging the frame F^1, or support of the globe directly to the upper part of the lamp reservoir, or its receiver, substantially as and for purposes stated.

A.D. 1874, January 2.—No. 25.

GOTTHEIL, ROBERT, of the "International Patent Office," 126, Linden Strasse, Berlin, Prussia, civil engineer.—(*A communication from Frederic Guillaume Gilles, of Cologne, Prussia, engineer.*)—"Improvements in motors to be worked by gas."

This invention relates to engines for obtaining motive power from the explosive combustion of gas and air. A cylinder is fitted with a working piston connected to a crank, and with a loose piston free to make an outstroke, but stopped by friction clamps from making its instroke, till these clamps are relieved by an eccentric. The cylinder has passages for the supply of gas and air, and the issue of products of combustion between the pistons and for the egress and ingress of air beyond the loose piston, with suitable slides and valves. The explosion of the gaseous mixture between the pistons forces both the working piston and the loose piston outwards, and the latter being held by the clamps, the working piston is then forced by the atmospheric pressure inwards, and the loose piston being released also moves inwards, the approach of the two pistons discharging the products of combustion from the space between them. The fly wheel causing the working piston to perform part of its outstroke, the gaseous mixture is drawn into the cylinder and ignited, and the action is repeated.

A.D. 1874, January 2.—No. 26.

FORBES, The Revd. GRANVILLE HAMILTON, rector of Broughton, in the county of Northampton.—"Improvements in the manufacture of gas for illuminating and heating purposes."

My invention relates to a compound of the foul or refuse lime of gas works with bituminous substance and other materials. I throughly mix the materials and then subject them to the process of distillation.

A.D. 1874, January 2.—No. 27.

PAGE, ROBERT WILLIAM, of High Holborn, in the county of Middlesex, engineer.—"Improvements in "apparatus for actuating the valves of steam engines."

This invention has for its objects, methods of reversing, or stopping steam engines, the valves of which are driven by a single excentric. For this purpose the excentric is fixed upon a driving shaft and is connected to the valve spindle by a link jointed at its extremities and also at or near its centre. The ends of this jointed link are guided by slides or vibrating rods, and its central joint is guided by being jointed to one end of a rod, the other end of which is attached to a centre moveable by a handle or lever, so that the rod can be fixed in a position either parallel with or at right angles to the line of the excentric rod and valve spindle, or in any position between the two.

A.D. 1874, January 2.—No. 28.

FORBES, The Revd. Granville Hamilton, rector of Broughton, in the county of Northampton.—" A " new or improved compound to be used as fuel."

My invention relates to a compound of the foul or refuse lime of gas works or its equivalent with coke, coal, or cinders, with or without bituminous substance, oil, and vegetable matter. I combine the materials in such a manner that the compound may be used as fuel in any stove or furnace.

A.D. 1874, January 2.—No. 29.

GREEN, Henry Thomas, and PRICE, Charles Wetherill, both of the city and county of Bristol.— " Improvements in brakes for railway trains."

Blocks suspended from the carriage frames between the wheels are caused to press on the permanent way, by means of levers operated by a shaft, extending from end to end of carriage; the shaft being coupled to its adjoining carriage shaft by clutch or other connection.

A.D. 1874, January 2.—No. 30.

THRELFALL, Richard Arrowsmith, HAMER, Walter, and BOND, John, all of Bolton, in the county of Lancaster.—" Improvements in the construction of apparatus for scouring or polishing fluted " rollers used in machinery for preparing and spinning cotton and other fibrous materials."

The apparatus consists principally of a bed or frame carrying a pair of headstocks, somewhat similar to a lathe, which support and give rotary motion to the fluted roller, whilst a pair of clamps faced with leather or other suitable material embrace the roller and move to and fro in a longitudinal direction.

A.D. 1874, January 2.—No. 31.

SUTHERLAND, William, of Manchester, in the county of Lancaster, house decorator.—" Improvements " in painting, gilding, silvering, and ornamenting the surface of glass, and protecting the same from " injury."

The plate of glass is first ground on one side and the design traced upon it, the colours, paints, and metals are then applied with varnish or size, and the glass is then put in a stove to dry and harden; other colours or metals are then applied and hardened in the same way. The ornamented glass may be secured to slabs of cement or other substance; another part of my invention consists in the application of the transfer process used in porcelain to ground glass.

A.D. 1874, January 2.—No. 32.

LANCASTER, Thomas, of Liverpool, in the county of Lancaster.—" Improvements in apparatus for " supplying fuel to steam boiler and other furnaces and fire grates, and in fire bars to be used therewith."

An apparatus constructed according to this invention consists of a conical hopper, inside of and in which are teeth, blades, or cutters, which may be adjusted to any given angle. At the top of the hopper there is fixed a cross bridge and at the bottom a footstep, which carry a vertical shaft, on which is fitted a roller provided with teeth, blades, or cutters, set at given and variable angles. The teeth, blades, or cutters, are so placed as to work and come in contact with the coals passing through the hopper, which coals are crushed by the roller with its teeth, blades, or cutters, and the teeth, blades, or cutters on the inside of the hopper. The vertical shaft carrying and dividing the roller is made to lift up and down by means of a screw and wheel, and thereby the amount of feed can be regulated, also the size of coal for distribution. Underneath the crushing hopper or box is fitted a distributing box fitted with beaters, or distributors of the usual form applied to mechanical stokers. Fire bars for furnaces constructed according to this invention, and to be used in connection with the mechanical stoker before described, are made partly moveable by means of a revolving shaft at each end of the furnace. On these shafts are fixed a series of tappets so as to raise one half of the fire bars from the other and move them backwards and forwards.

A.D. 1874, January 2.—No. 33.

VAN-CAMP, Aaron, of Washington, in the United States of America, now residing at the Inns of Court Hotel, Holborn, and CLARK, George, of No. 10, Craven Buildings, Drury Lane, in the county of Middlesex.—" Improvements in road, street, tram, and path-way pavements, and in the composition of " paving materials."

1. The production of asphaltum concrete by combining asphaltum with broken and pulverised stone or rock, and its application to paving and other purposes in the manner described in the Specification. 2. The moulding of asphaltum concrete into quarries or blocks of any required form or size, and their application to paving & other purposes. 3. The imbedding and fixing of tramway rails in asphaltum concrete or asphalte pavement, and making rails of a suitable form for that purpose, substantially as described in the Specification. 4. The formation of a channel in asphalte pavement in which tramway rails are fixed, such channel running along one side of each rail in the manner described in the Specification.

A.D. 1874, January 2.—No. 34.

FORBES, Granville Hamilton, Clerk in Holy Orders, rector of Broughton, in the county of Northampton.—" Improvements in compounds designed for the manufacture of cements, plaster, or artificial " stone, capable also of being used for artificial fuel."

According to my present invention I combine the foul lime of gas-works, or its equivalent, with coke, with or without chalk or limestone, with or without bituminous substance, and with or without hydro-carbon oil or spirit. The compound is burnt in a grate or stove, and when sufficiently burnt is reduced to powder for use as cement or plaster or artificial stone.

A.D. 1874, January 2.—No. 35.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Thomas L. Jones, of Natchez, Mississipi, and Anthony Pauly, of New Orleans, Louisiana, mechanical engineers, both of the United States of America.*)—" Improvements in com- " bined high and low pressure steam engines."

The object of this invention is to provide means whereby the advantages of a high pressure and of a low pressure engine can be obtained in a single construction. It consists mainly in the use, in combination with the cylinder of a high-pressure engine, of a device, by means of which, after all of the exhaust steam at each stroke of the piston, saving one atmosphere, has been exhausted into the open air, the remainder is diverted into a condenser, and in consequence creating a vacuum in that end of the cylinder towards which the piston is moving. This device preferably is an inclined chamber connected with the exhaust side pipe of the engine at a point between the exhaust ports therein. In the chamber on a single-valve-stem are arranged what are respectively termed an "atmospheric" and a "condenser" valve both balanced. These valves are caused to open and close an "atmospheric" and a "condenser" port, said ports respectively leading to the open air and to a suitable condenser. At each movement of the piston, the exhaust steam passes off through the "atmospheric" port until an equilibrium between the air without and the steam pressure within the cylinder is established. At that instant the "atmospheric" valve closes, and the "condenser" valve opens, creating a vacuum in the cylinder, thus in effect increasing the pressure on the other side of the piston fifteen pounds. In applying the invention to slide-valve engines, the valve and valve chest therein are peculiarly recessed and arranged, and the chest is provided with two exhaust ports, each in turn provided with escape valves, and all operating so as to enable the remaining one atmosphere of exhaust steam to be diverted as above set forth into a condenser. The invention also relates to an improved condenser consisting mainly of a cylindrical chamber provided with a convex perforated crown sheet at its top; above this sheet, leaving a space between, is a tight cover. A casing fits down over all leaving a space above the cover, and an annular space around the side wall of the chamber which is perforated. In the centre of the top of this casing is a pipe through which the exhaust steam comes. In the centre of this last mentioned pipe is an upturned jet termed an auxilliary spray. In operation, the steam passing down the pipe encounters a spray of water fed from some convenient source. This initates a vacuum which is maintained afterwards by the condensation occurring in the chamber. The steam passes down into the annular space around the chamber and thence through this perforated side-wall into the chamber, there to encounter a heavy shower of water created by water being (by the vacuum) drawn up an inlet pipe that extends from the condensing-water source below, upward through the centre of the chamber and through its perforated crown-sheet above described. Owing to the convexity of the sheet, the water tends to collect at its circumference. The hot water containing the condensed steam is drawn off by pumps through the bottom of the chamber.

A.D. 1874, January 2.—No. 36.

GOTTHEIL, Robert, of the International Patent Office, 126, Linden Str., Berlin, Prussia, civil engineer. —(*A communication from Alphons Lemmens, of Gladbach, in the Kingdom of Prussia.*)—" Improvements in " the means and apparatus for dyeing warps."

This invention relates to the dyeing of warps, more particularly such as are employed in fabrics having a cotton warp and woollen weft.

The dyeing apparatus is arranged between the warp beams and the usual dressing machinery, so that the warp runs without manipulation from the one to the other, becoming dyed in its course by being passed through a succession of troughs containing the liquid dye or mordant, each trough being provided with guide and dipping rollers and squeezing rollers. In one or more parts of its course the yarn is led over heated cylinders overhead, so as to expose considerable length for drying.

A.D. 1874, January 3.—No. 37.

COHNÉ, Sigismund, of Soho, London, in the county of Middlesex.—" A new composition for axle, shaft, " and spindle, and other similar bearings, and the manufacture of bearings therefrom."

The chief feature of novelty in this invention is the application of asbestos combined in certain proportions with plumbago, both well ground, intermixed, and made into a semi-dry paste with silicate of soda or silicate of potash liquid. The paste is pressed into a mass, from which the bearings may be cut or turned or may be moulded at once into the form desired. In any case it is well dried and afterwards impregnated in its pores with melted paraffin or ozokerit.

A.D. 1874, January 3.—No. 38.

CHAPMAN, Gavin, of Glasgow, in the county of Lanark, North Britain, manufacturing chemist.—" Im- " provements in making sesquicarbonate of ammonia."

This invention consists principally in vaporising urine, gas liquor, or other ammoniacal liquor; removing some of the liquor when the carbonic acid becomes deficient; distilling ammonia from the removed liquor, carbonating it, and mixing it with the raw liquor.

A.D. 1874, January 3.—No. 39.

WESTRUP, Henry Joseph, of No. 10, Austin Friars, in the city of London, gentleman.—" Improvements " in apparatus for indicating the position of the rudder in vessels."

This invention consists,—

Firstly. In a means of rotating the lamp or other indicating medium by gearing or other equivalent instruments set in motion by the rudder and put in and out of action as required by a screw, cam, lever clutch, or other suitable mechanical device. The same object is also effected by a cord or chain moved by the rudder, and having a knot or other enlargement which engages with certain guide wheels and forks or projections to turn the lamp or other indicating medium, and disengages therefrom when the said lamp, etcetera, is intended to remain stationary. When necessary, a brake or locking apparatus is employed to retain the lamp, etcetera in position when the driving means is thrown out of action.

Secondly. In an arrangement of running and guiding tackle for hoisting and lowering and maintaining in position revolving lamps, shades, or semaphores from the deck, so as to avoid going aloft to attach or detach them, such hoisting and lowering tackle admitting of the necessary revolution of the lamp, shade, or semaphore being effected by the means forming the first part of the invention or otherwise.

A.D. 1874, January 3.—No. 40.

EMSLIE, James Thomas, engineer, of Aston, in the county of Warwick.—" Registering the number of " passengers or people entering or leaving tramway cars, omnibuses, etc., or for any similar purpose."

One or more travelling bands or strips of paper or suitable material is in its progress perforated and cut for purposes of numerical registration, by tools actuated by levers or mechanism, by passage of persons through a telltale bar or gate, or treading or passing over a step or platform. Continuous or intermittent clockwork movement of the bands or strips and self winding up arrangement of same with sometimes a preventive contrivance against overwinding.

A.D. 1874, January 3.—No. 41.

NICHOLLS, Henry Martyn, civil engineer, of 143, Great Portland Street, in the county of Middlesex. —" Improvements in apparatus for cutting continuous paper into sheets, and in piling or disposing of the " same when cut."

In the process of cutting sheets from the web the improvements relate—

First. To cutting, combined with securing the tail of the sheet for piling, being improvements on the invention described in Specification No. 3510 (1869).

Secondly. To mechanism for cutting and piling independently. In both cases there are provisions for stopping the paper, for cutting and dealing with the paper that accumulates during the cutting.

Thirdly. To mechanism described in Specification No. 2808 (1866), in which the knife and gripper revolve with a cylinder, and the knife turns on a centre to deliver the tail of the sheet.

And in the process of piling, the object is to form a vertical pile of sheets laid horizontally.

First. A quire of sheets are piled, and at proper intervals the quires are carried forward and piled on to an accumulating pile by blasts of air.

Secondly. The sheets as they are cut are carried forward separately by running tapes and piled by blasts of air.

And thirdly. There are two tables, one over the other, with two lines of running tapes diverging from the cutting point to each table respectively.

A.D. 1874, January 3.—No. 42.

HIGGINSON, Andrew, of Liverpool, in the county of Lancaster, engineer.—" Improvements in and con- " nected with governors for motive power engines."

First. I construct a governor of two rotating cog-wheels in a case filled with water or other liquid. These cog wheels are rotated from the engine. For the space of two cogs two projecting pieces are provided one at each end of the case; one of the said pieces is made adjustable to regulate the flow of liquid. A cylinder with a loose piston is fitted to the case and has communication with the interior of the case, one end above and the other below the cog-wheels.

Second. For the purpose of properly controlling the motion of engines provided with the above or any other governors, I make use of a reacting weight fitting loosely in a cylinder filled with liquid. The said weight is connected to the governor by or through a spring directly or indirectly, so that too energetic action of the governor is counteracted.

A.D. 1874, January 3.—No. 43.

PETRIE, John, junior, of Rochdale, in the county of Lancaster, machine maker.—" Improvements in " machinery or apparatus for scouring or washing and dyeing wool and other fibrous materials."

This invention consists, firstly, in a method of giving motion to the rakes of washing and dyeing machines. Secondly, in a method of squeezing the wet material and returning the liquor to the trough. Thirdly, to an oscillating conveying apparatus; and in a method of straining the wet material as applied especially to dyeing: the rakes pass through a grid, and an air tight cover is adapted.

A.D. 1874, January 3.—No. 44.

HARRINGTON, John, of Ryde, Isle of Wight, gentleman.—" Improvements in locks or fastenings."

This lock or fastening is formed in two parts, one of which is capable of being screwed or slidden into the other part.

When the parts are screwed together teeth are formed on the end of the male part of the lock, into which a spring catch takes to keep the parts in their locked position; a spring catch being also employed to retain the parts in their locked position when they are slidden together. In both cases a key is employed to raise the spring catch to allow of the two parts of the lock being separated.

A.D. 1874, January 3.—No. 45.

PATERSON, James, of Leyton, in the county of Essex.—" Improvements in machinery or apparatus for " capsuling bottles and other vessels."

This invention relates to improvements on the capsuling machine arranged to be worked by mechanical appliances in lieu of by liquid or air pressure described in the Specification of Letters Patent granted to me the 28th of November 1871, No. 3213; and consists in imparting a self-adjusting oscillating or pivotting motion to the slides or dogs which press upon the india rubber chamber so as to accomodate the pressure to tapered bottle necks.

A.D. 1874, January 3.—No. 46.

LANCASTER, JOHN, of Vine House, Canning Town, London.—" Improvements in horse shoes."

In order to prevent slipping I propose to form a groove on the ground face of the shoe into which is inserted blocks of wood having nails with the heads projecting driven into them, or furnished with strips of steel or iron.

I also attach to the shoe an artificial frog having the under surface of leather or other material and fitted to a web or flange at the back of the shoe.

A.D. 1874, January 3.—No. 47.

PEEL, JOHN, weaving manager, and **EMSLEY, SIDNEY**, agent, both of Bradford, in the county of York. —" Improvements in looms for weaving."

This invention relates to checking shuttles and pickers and lubricating the picker spindles. A metal apparatus in which is formed a chamber is employed; in the chamber is placed felted wool or any other material imbibing oil; the picker spindle passes through the chamber and felted wool.

A projection is cast on the chamber, to which is attached a check strap, checking the shuttle, picker, and lubricator; the spindle is lubricated upon its length by the picker.

A.D. 1874, January 3.—No. 48.

BETTELEY, JOSEPH, of Lime Street, in the city of London, marine architect.—" Improvements in the " construction of propellers, and in the arrangement or method of fitting them in vessels for the propulsion " thereof."

This consists of, firstly, constructing propellers from a combination of wrought and cast metals, the blades having narrow necks and eyes as described; and, secondly, employing two or more propellers upon the same shaft, the propellers being either in separate apertures in the dead wood in the same aperture, or one or two in an aperture, and one projecting within or beyond the stern post of a vessel.

A.D. 1874, January 3.—No. 49.

CLARK, EDWARD PODMORE, of Bath, in the county of Somerset.—" An improved apparatus for teaching " military drill."

The chief feature consists in mounting the figures or men on pins or pivots, so that they may be removed and placed in any position required. The pins are fitted in rows or otherwise in a base plate, and each figure is mounted on a grooved disc, so that by gearing these together by a band or otherwise, different movements may be executed simultaneously by all the figures if desired.

A.D. 1874, January 3.—No. 50.

GIBBS, WILLIAM ALFRED, of Gillwell Park, Sewardstone, near Woodford, in the county of Essex, Esquire. —" Improvements in machinery and apparatus for drying."

This invention relates to inventions described in the Specifications of Patents Nos. 2145, A.D. 1870, and 314, A.D. 1872, and consists firstly of the following apparatus:—The said apparatus consists of an open trough containing an air-duct of an improved form. Heated air is forced through the air-duct and its lips, and dries the substance in the trough, which substance may be caused to pass along the trough by the inclination of the said trough, or by a reciprocating floor, or by a " creeper," and is lightened up by tines worked by cranks and tappets. A fixed or a vibrating longitudinal diaphragm is used in the air-duct, or a sheet of iron bent into the shape of the air duct and perforated may be fixed inside the air-duct or to the reciprocating floor, so as to constitute an inner air-duct.

Instead of employing tines for lightening up the substances to be dried it may be fed into two revolving cylinders of woven wire or of perforated metal mounted in the trough.

The invention further consists in applying shelves or tines to the interior of the aforesaid cylinders, and to the interior of the revolving cylinders or cases described in the Specifications herein before referred to.

The invention further consists in arranging revolving tubes in cylinders or cases of either of the kinds above referred to.

The invention further consists of improved machinery for drying, consisting of a case surmounted by a jogging cover, and divided longitudinally into compartments, each of which is furnished with an endless band carrying tines and with air ducts at each side. This case is combined with an air heating apparatus and fans so constructed and arranged that the heated air and products of combustion from the furnace shall be driven through the air ducts in the upper compartments of the said case so as to act upon the wettest portion of the substance to be dried, and that heated air from air heating tubes in the fire-box shall be driven into and through the air ducts in the lower compartments of the said case, so as to complete the drying of such substance.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from June 27 to July 3, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, January 5.—No. 56.

DELAVIGNE, Narcisse Alphonse, of Paris, in the department of the Seine, in the Republic of France, gentleman.—"A new cork-screw."

This corkscrew is composed of a lever or handle having a slot in which plays a piece ending at one part in a forked extension and carrying a ring in the middle.

The lever is terminated beyond the above mentioned slot by a socket or cap in which moves the head of the bit of the corkscrew, so that it may always lower at a right angle to the lever. A spring fixed on the lever where the cap begins, serves to prevent the bit from rising in a contrary direction; for this purpose the head of the bit ends in a stop piece which lodges in a notch made within the cap at its base.

When the instrument is used it is screwed into the cork in the ordinary manner and in its rectilineal position until the ring comes against the neck of the bottle where it is stopped by means of a shoulder or collar forming bearing made inside the ring and of one piece with it.

This shoulder supports the entire strain of the operation, and this strain being in inverse direction to the resistance, there is equilibrium, and all danger of breakage is obviated.

The end of the fork coming on to the neck of the bottle when the lever is brought down the result is a point of contact serving to completely counter-balance the lever upon which it is only necessary to exert a very moderate pressure to bring the cork out of the bottle in a perfectly vertical direction and in the axis of the bottle, in the same way as the beam acts upon the piston in a pump.

A.D. 1874, January 5.—No. 59.

ANDREWS, Alfred Christmas, of Birmingham, in the county of Warwick, machinist.—"New or im-"proved machinery to be used in the manufacture of boots and shoes."

This invention consists of machinery for paring and finishing the edges of the soles and heels and the edges and chamfers or inclines of the waists of boots and shoes, and also for burnishing black bottoms of boots and shoes.

The paring of the edge of the heel is effected by a disc-like rotating cutter, and the paring of the front of the heel by a rotating cutting blade or by a disc-like cutter, the boot or shoe being supported by a roller and moved against the cutter by the workman. The edge of the sole is pared by a fixed adjustable cutter, the boot or shoe being guided and protected by a small guide roller. A rotating disc-cutter may be used instead of the fixed cutter. The chamfering of the waist of the boot or shoe is effected by an oscillating rasping or chamfering tool, a guide roller guiding the boot or shoe and preventing the tool injuring the upper leather. The finishing of the edges of the soles and heels and waists of the boots and shoes is effected by a series of heated smoothing or ironing tools, having an oscillating motion, the burnishing ends of the tools being made to rub against the required parts as the boot or shoe supported on a roller is carried against the said tools by the workman. By a change of tools the burnishing of a black bottom to the boot or shoe may be effected.

A.D. 1874, January 6.—No. 64.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from George Washington Morris, John Seilor Robinson, George Norbury Mackenzie, and Perry Espey Brocchus, all of the city of Baltimore, in the state of Maryland, United States of North America.*)—"Improvements in the

" structure of furnaces, and the apparatus connected therewith for manufacturing iron and other metals " by the use of hydrocarbon vapour or gas combined, with or without superheated steam for heating " purposes."

My improvement consists in constructing and combining mixing and combustion chambers with smelting and puddling furnaces, for using hydrocarbon vapour or gas combined with air or superheated steam as fuel for heating purposes.

A.D. 1874, January 7.—No. 86.

CAIN, Thomas, of Lake Douglas, in the Isle of Man, engineer.—" Improvements in and in connection " with hollow bars for furnaces or fire-grates."

The chief features of novelty in this invention are—

(1.) The construction of fire bars having two or more holes or passages running longitudinally for the purpose of connecting with hollow upper and lower chambers.

(2.) The hollow upper and lower chambers before mentioned, and the placing of the same in some cases at or near the centre of the hollow fire-bars.

(3.) The construction of the fire bars, the end pieces, and the hollow chambers with holes to facilitate cleaning; and the providing of these holes with screw plugs or other stoppers.

(4.) The use of condensed water from a surface condenser for circulating in the bars.

A.D. 1874, January 8.—No. 108.

VERNON, William John, of the Belle Vue Mineral Water Works, Crewe, in the county of Chester. —" Improved means for effecting the closing or stoppering of aerated liquid bottles having internal " stoppers."

This invention has for its object to facilitate the closing or stoppering of aerated liquid bottles having light internal stoppers, for example, stoppers consisting of a vulcanized india rubber washer fixed on a light spindle stem or cylinder, the specific gravity of the entire stopper not exceeding the specific gravity of the liquid in the bottles. Such bottles whilst being charged with aerated liquid in a bottling machine are for this purpose usually inverted or turned with their necks downwards, but their stoppers being comparatively light do not when the bottles have been charged sink or fall into their proper positions for closing the same.

Now this invention consists in effecting the closing or stoppering of such inverted bottles as aforesaid by attaching or connecting to the stopper before placing the bottle in the filling or charging machine a closing device of such specific gravity, that the weight of the stopper and closing device combined shall exceed the specific gravity of the liquid contained in the bottle, thereby causing the stopper to descend and (guided within the orifice of the bottle's neck by the spindle and closing device thereto attached) to assume the proper position for closing or stoppering the orifice in the bottle, in which position the stopper will be retained by the pressure of the gases within the bottle. The weight or device may then be removed from the spindle stem or cylinder of the stopper, and applied to the stopper of another empty bottle and so on.

A.D. 1874, January 8.—No. 115.

COX, William, of Camperdown Linen Works, Lochee, in the county of Forfar, North Britain, manufacturer.—" An improvement in sacks or bags."

The feature of novelty which constitutes this invention is the insertion of one or more cords between the stitched portions of sacks or bags.

A.D. 1874, January 9.—No. 130.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent, agent.—(*A communication from Jean François Renard fils, of Liège, Belgium, machinist.*)—" An improved " steam generator, applicable to stationary engines."

This invention relates to a multitubular steam generator with exterior fire-place, applicable to fixed engines.

The generator is composed of two cylinders of equal diameter, but of unequal length, united by a tube or cylinder of half their diameter, and by tube plates receiving a considerable number of steam tubes, which are exposed to the direct action of the fire; the flame and the gasses after passing through the sheaf of tubes going into two flues. Behind the fire-bridge is a reservoir receiving all the particles of coal carried away by the gasses. The feed takes place from the bottom end, which also serves as reservoir for the calcareous deposits accumulating within the generator.

The advantages claimed are—Great production and rapid getting up of steam, great saving of fuel by the complete utilization of the caloric, lightness and relatively smaller bulk, good steam and water chamber, construction simple, and easy inspection, repair, cleansing, and freeing from incrustation.

A.D. 1874, January 15.—No. 192.

STEWART, Duncan, of the firm of Duncan Stewart and Company, engineers, of the city of Glasgow, in the county of Lanark, North Britain.—" New or improved constructions of clips or holders and their chains " for cloth-stretching and finishing machines."

This invention consists of an improved construction of the parts of chain clips for griping the selvages of cloth while being treated in stretching and finishing machines (such as the "Bridson" and others) being also improvements on the patented invention, John Erskine Brown, No. 3415, dated 29th December 1866, and consists in forming the chain in a parallel form, each link of a light deep hollow rectangular form, to receive the teeth of their chain wheels, and having an open or double and a single central joint piece at their opposite ends, so that the front end of each fits into the back end of the next link, with a pin passed through them and riveted on each side to form the articulate joint between the links throughout the chain. Each link carries the lower stationary jaw of the clip attached to its one side by two arms, to which the upper movable jaw is jointed by two arms projecting down from it and a long small joint pin, upon which an improved construction of twisting spiral spring is mounted, coiled out of a single piece of fine hard drawn steel wire, from a projecting looped lever piece in the centre towards each side in right and left handed spirals, leaving the two free ends projecting to prevent their twisting, while the looped lever piece is free to act, by the power of both spirals, on a central pendant arm of the upper acting jaw of the clips to make it gripe the selvage of the cloth, otherwise all much in a usual manner ; an arm projects upwards from the moving jaw, which works on a stationary cam or groove surface to pull it back against the power of the spring at the parts of the machine where the cloth has to be entered or released from these grips or gripers, while and by the motion of these and the chains through the machine.

A.D. 1874, January 16.—No. 208.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from John Rogers, of the city, county, and state of New York, United States of America.*)— " Improved apparatus for the manufacture of lamp black."

I so construct a lampblack furnace that a natural vertical air current will be created by the flame all round the pan, and supply only just as much air to the flame as will convert the products of combustion into lamp black. I make the pan of annular form with a central perforated pipe for the supply of air, and I also make the shell or furnace, enclosing the combustion chamber with double walls perforated for admitting radial horizontal air currents to mingle with the upward currents.

A.D. 1874, May 7.—No. 1606.

NANGLE, Walter Chidiock, of Bull Point, near Devonport, in the county of Devon, late Captain Royal Artillery, Assistant Controller, Bull Point establishment.—" An improved paint or compound for " coating metals, woods and other other substances."

The basis of this improved paint is tar from which some of the oils have been extracted, the nature of tar freed from these oils differing materially from that of ordinary tar.

This tar is mixed with rosin and sulphur, or with shellac or other equivalent for the rosin, or with shellac and rosin, and in some cases the sulphur may be dispensed with.

The mixture is diluted with spirits of turpentine.

Paint thus prepared will give a beautiful black enamel appearance to any surface upon which it may be applied, but strong stainers may be added to give it different colours.

A.D. 1874, June 29.—No. 2246.

MURDOCH, Henry Hunter, of No. 7, Staple Inn, in the county of Middlesex, patent agent.—(*A communication from William Anthony Shaw, of the city of New York, in the United States of America.*)—" Improvements in closing the ends of metal pipes, and in connecting and soldering metal pipes together,

" and in the combination of metals or alloys for the latter purpose, parts of which improvements are " applicable to other purposes."

This invention consists, firstly, of improvements in closing the ends of pipes. A peculiarly shaped collar screwed externally is placed in the mould in such a position that when the pipe is cast the said collar shall be securely fixed thereon. The pipe may then be closed by means of a cap in which is formed a screw thread corresponding with that on the collar. Instead of screwing the cap to the collar on the pipe, the said cap may be secured by means of lugs on the said collar engaging with inclines on the cap.

The invention consists, further, in connecting metal pipes together by means of a sleeve lined with solder.

The invention consists, further, in combining fine and coarse solder in various forms. Or fine and coarse solder may be cast in a suitable vessel and pressed out through a die in the form of bars, tubes, rods, or sheets. This part of the invention is applicable to the manufacture of foil.

A.D. 1874, June 30.—No. 2254.

MORTIMER, Michael, manufacturer, and **BATEMAN, Daniel**, card manufacturer, both of Wibsey, near Bradford, in the county of York.—" Improvements in looms for weaving."

This invention "relates to swivel looms, in which small shuttles are employed to weave figures or patterns on a plain or figured ground, and stopping the tappets while the swivel shuttles are producing the pattern, and in starting the tappets while weaving the plain or figured ground between the patterns, or weaving the ground during the process of producing the pattern ".

When plain or figured parts have been woven the jacquard acts upon a band actuating a lever which forces back clutch boxes and plates fitted on the tapped shaft, throwing out of gear the tappets from the tappet boxes and stopping the ordinary ground shuttles, whilst the silk is picking and throwing out every other pick when weaving figures. The tappets are thrown in gear by a spring and band acted on by the jacquard.

The tappet shaft works spur gear operating on levers, to which are attached bands passing over pullies, and which are also attached to regulating screws fitted to the swivel rack, giving a forward and backward motion to the swivel rack to weave the figures or pattern. The spur gear works a tappet actuating a lever, giving a rocking motion to a lever and shaft; on the shaft are fitted excentrics lifting the swivel rack and shuttles out of the way of the ground shuttle with its weft to be picked and lowered for throwing in the figure weft as and when required. A catch is fitted to the rack shaft acted on by a band, which is worked by the jacquard throwing the rack shaft from flyer to flyer.

The swivel shuttles are fitted with brushes acting as breaks or retarders to the yarn or silk, preventing it coming off slack.

A.D. 1874, June 30.—No. 2256.

WAUGH, John, of Bradford, in the county of York, engineer.—" Improvements in smoke prevention."

This invention consists of an arrangement of steam jets and conduits, to which is given such an inclination as to concentrate the air, forced in by jets, upon the fire, thus forcing the smoke through to the live coal below and insuring combustion. The conduits are so arranged as to prevent cold air or steam coming in contact with the hot crowns of furnaces. The mouths of conduits are closed in the same instant the steam jets are closed, thus preventing air rushing in when not required; by a simple connection from the lever of this arrangement to the door of the furnace, the jets are opened in the act of opening the door, thus making the apparatus self acting.

A.D. 1874, July 1.—No. 2284.

POPE, Albert Augustus, in the county of Suffolk, and state of Massachusetts, United States of America.—(*A communication from Henry Marcus Quackenbush, resident at Herkimer, in the county of Herkimer, and state of New York, of the United States of America.*)—" Improvements in air guns or pistols."

This Complete Specification describes this invention to be a class of toy guns for shooting darts or other projectiles, in which a plunger impelled suddenly by the stress of a powerful spring within a closed chamber whose outlet is the barrel of the gun, drives the air from such through such barrel, and expels the projectile which has been placed in the rear or breech end of the barrel, the plunger being driven in a direction opposite to that taken by the projectile in its flight through the barrel.

The invention consists in a certain arrangement of parts whereby is obtained greater efficiency in action, more graceful and pleasing appearance, and certain conveniences in diminishing the gun when necessary.

A.D. 1874, July 1.—No. 2288.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Ralph Samuel Lee Walsh, of Washington, district of Columbia, United States of America, Doctor of Medicine.*)—"Improved apparatus for syringing bottles."

The nature of my invention consists in the combination of a rubber bulb adapted to be applied to the neck of a bottle, and provided with a nozzle or tube, and a valve arranged to operate substantially as hereinafter set forth.

A.D. 1874, July 1.—No. 2289.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Joseph Baker, of Trenton, Canada, gentleman.*)—"An improved combined "scoop and sifter."

This invention consists in making the bottom of the scoop removable and providing a series of interchangeable sieves, colanders, and the like, to be used in place of the bottom; in providing the scoop with a vibrating agitator to work the materials through the sieve or colander; and in providing the body with graduations to indicate the amount of materials therein.

A.D. 1874, July 1.—No. 2291.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from John H. Crowell, of Providence, Rhode Island, United States of America.*)—"An improved machine for making weavers' harness."

The object of this invention is to produce a machine which shall automatically make that description of loom harness in which the eyes are formed by clasping two metallic bands at the requisite distance apart around the two contiguous twines which constitute the respective heddles of the harness as distinguished from those descriptions of loom harness wherein twines which constitute the heddles are knotted or otherwise concatenated to form the eyes.

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3. Index of Names to Chronological and Descriptive Index from January 1 to January 3, 1874, and to Appendixes from January 4 to July 3, 1874.
4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 3, 1874, and to Appendixes from January 4 to July 3, 1874.

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CONTAINING THE

BRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 4 to January 10, 1874.

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, James, of Number 2, Gough Street, Stainsby Road, Poplar, and MACGEORGE, William,
er 114, Fenchurch Street, both in the county of Middlesex.—"Improved circulating water tubes
lers, and method for forming the same."

d syphon tubes are suspended from the boiler over the furnace or flue, the upper ends being in
cation with the inside of the boiler, and the bent portion exposed to heat One end of the tube is
an the other.

ol for bending these tubes consists of a mould fitting between the syphon when finished and
oon it; at the centre of the band there is a lever carrying a roller. By placing a heated pipe in
d and turning the lever round it may be bent to the required shape.

A.D. 1874, January 5.—No. 52.

M, William, of Liverpool, in the county of Lancaster, stevedore.—"Improvements in appliances
ratus to be used in unloading bulk cargo from ships."

nsists of portable appliances or apparatus to be placed over, alongside, or attached to the hatchway
h the grain is to be discharged. Shafts, pullies, endless bands or chains of buckets, and endless
provided for elevating the cargo from the hold and conveying it over the ship's side to a quay or
. The apparatus is operated by a steam winch or ordinary deck engine.

A.D. 1874, January 5.—No. 53.

avid Clovis, of Saint Denis, in the department of the Seine, France.—"Improvements in the
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ion of carbonate of lime is precipitated with a proportionate quantity of lime white, and the water
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or wood, similar in construction, and boxing one within the other, and either square, round or
able form; within these frames a felt or other filtering substance is stretched, and when the matter
red is very tenuous, a layer or layers of carded cotton having the filtering surface between two
ts is employed.

ter arriving at the first filter is clarified after passing through the second and third ones.

he water is very impure the first filter becomes choked; it is consequently removed by levers, or
and cleansed in a water bath.

ole column of filters is raised mechanically, and under the last a clean filter is placed; the second
he first, the others following in rotation.

re frequently the first filter is removed, the quicker the filtering is performed.

ter contained in the last filter still holds sulphate of lime in solution unprecipitated by the lime
ertheless the water is purified to the extent of $\frac{2}{5}$.

ent this sulphate from injuring the heated sides of the generators, a proportionate quantity of
is added to the water, which prevents the agglomeration of the salts by transforming them into

A.D. 1874, January 5.—No. 54.

ERLIN, William Richardson Bigsby, Captain in the 24th Regiment of Foot.—"A new electro
power."

y the direct power of each magnet is used, and the alternate transmission and suspension of the
directed and regulated by clockwork.

A.D. 1874, January 5.—No. 55.

PERRY, Robinson Gale, of Dublin, in the county of Dublin, Ireland.—"Improvements in kilns or "drying chambers for drying peat, malt, grain, brewers' or distillers' grains, hops, or other similar "substances."

The novelty consists in dividing the kiln into several compartments which communicate with each other at the ends alternately, so that a continuous thoroughfare exists throughout the series. At one end of the kiln is the furnace, and at the opposite end the chimney; the heat and products of combustion circulate through the several compartments to the chimney. There is also a continuous tramway; and the goods to be dryed are placed in the kiln on trucks.

A.D. 1874, January 5.—No. 56.

DELAVIGNE, Narcisse Alphonse, of Paris, in the department of the Seine, in the Republic of France, gentleman.—"A new cork-screw."

This corkscrew is composed of a lever or handle having a slot in which plays a piece ending at one part in a forked extension and carrying a ring in the middle.

The lever is terminated beyond the above mentioned slot by a socket or cap in which moves the head of the bit of the corkscrew, so that it may always lower at a right angle to the lever. A spring fixed on the lever where the cap begins, serves to prevent the bit from rising in a contrary direction; for this purpose the head of the bit ends in a stop piece which lodges in a notch made within the cap at its base.

When the instrument is used it is screwed into the cork in the ordinary manner and in its rectilineal position until the ring comes against the neck of the bottle where it is stopped by means of a shoulder or collar forming bearing made inside the ring and of one piece with it.

This shoulder supports the entire strain of the operation, and this strain being in inverse direction to the resistance, there is equilibrium, and all danger of breakage is obviated.

The end of the fork coming on to the neck of the bottle when the lever is brought down, the result is a point of contact serving to completely counter-balance the lever upon which it is only necessary to exert a very moderate pressure to bring the cork out of the bottle in a perfectly vertical direction and in the axis of the bottle, in the same way as the beam acts upon the piston in a pump.

A.D. 1874, January 5.—No. 57.

AITKEN, Henry, of Falkirk, in the county of Stirling, North Britain, coal master.—"Improvements in "coking coal and other carbonaceous matters, and in the apparatus employed therefor."

The features of novelty which constitute this invention are—

First. The forcing or blowing of heated or cold air into the space of coke ovens or kilns above the upper surface of the materials being coked, so as to burn the gases and promote the coking process.

Second. The arrangement or construction of coke ovens or kilns with a moveable bottom or top, or with both the top and the bottom being made moveable.

Third. Forcing or blowing carbonic oxide or other neutral gas into coke ovens or kilns whilst the coke is cooling, in order to prevent waste of coke.

A.D. 1874, January 5.—No. 58.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—(*A communication from William Robinson Manley, of the city of New York, in the United States of America.*)—"Improvements in rotary "engines and pumps."

The invention which constitutes the subject matter of this patent has reference to that class of rotary engines in which two or more pistons are caused to revolve or rotate in a cylinder or case; and it is applicable in whole or in part to steam engines, pumps, water meters, and blowing or other engines, in which it or parts of it may be useful. The objects of the invention are to obviate the defects incident to the circular movement of a piston or pistons in contact with heads fixed to the cylinder or case confining the fluid; also to work the steam with variable expansion; to pack the moving parts steam tight; to sustain the pistons at their ends; to cause them to move properly to prevent the leakage of steam from the cylinder; and to equalize the steam pressure upon the exteriors of rotary cylinder heads. To these ends the invention consists primarily of the combination of a fixed steam cylinder or case with one or more revolving pistons and with cylinder heads which revolve with the piston or pistons, so that the unequal wear incident to the circular movement of the piston or pistons upon fixed heads is obviated. In place of arranging the cylinder stationary and the pistons and cylinder heads to revolve, the last two classes of instrumentalities may be stationary, and the cylinder may be arranged to revolve relatively to them, or the cylinder may be constructed to revolve in one direction, and the other instrumentalities to revolve in the opposite direction. The invention consists further of certain other combinations and constructions which are as follows, vizt.,

The combination of the fixed steam cylinder, the revolving pistons, and the revolving cylinder heads with packing rings arranged eccentrically to the centres of the cylinder heads and so as to pack the seams between the cylinder heads and the cylinder ends.

The combination of the fixed cylinder, the revolving cylinder heads, the piston hub, the piston sliding in said hub, and a rocking shoe connected with the outer edge of the said piston and moving upon the inner surface of the cylinder.

The combination of the fixed cylinder, the revolving cylinder heads, the piston hub, the sliding piston and bar-packing, arranged to pack the seams between the faces of the piston and the opening in the hub in which it slides.

The combination of the fixed cylinder with cylinder heads which are arranged to revolve eccentrically to the said cylinder, and are provided with radial grooves for guiding and sustaining the pistons.

The combination and arrangement of the cylinder, the piston hub arranged eccentrically to said cylinder, the sliding pistons, the grooved cylinder heads and piston slides connected with the ends of said pistons, and sliding radially or thereabouts in the grooves of the said cylinder heads.

The combination of the cylinder, the piston hub, the sliding piston, the revolving cylinder heads, the piston slides (constructed either in one piece with the piston or of separate pieces) and friction wheels or slide-blocks which are connected with the outer ends of said piston slides, run in ring guiding grooves, and operate upon the pistons so as to hold them or their rocking shoes in close contact with the surface of the interior of the steam cylinder.

Also. The combination of the cylinder and the revolving pistons, with a steam port divided into sections, and with a cut off valve for closing and opening one or more of said sections, so as to cut off the steam at an earlier or later part of the revolution of the pistons.

Also. The combination of the cylinder and the revolving pistons, with a divided steam port having its orifices arranged in two alternating series, and with a cut off valve operating to cut off the steam progressively.

Also. The combination of the cylinder and the revolving pistons, with a divided steam port having two series of outer orifices, and with a double faced cut off valve arranged between the said two series of orifices, so that the pressure upon the cut off valve is balanced or thereabouts.

Also. The combination of the cylinder, the piston hub, arranged to revolve eccentrically to said cylinder, the revolving pistons and the revolving cylinder heads, with head jackets, which cover the said cylinder heads.

The combination of the cylinder, the piston hub, the revolving pistons, the revolving cylinder heads, and the head-jackets enclosing said heads, with an equalizing passage connecting the cavities of the head jackets so as to equalize the pressure upon the revolving cylinder heads.

A.D. 1874, January 5.—No. 59.

ANDREWS, ALFRED CHRISTMAS, of Birmingham, in the county of Warwick, machinist.—" New or improved machinery to be used in the manufacture of boots and shoes."

This invention consists of machinery for paring and finishing the edges of the soles and heels and the edges and chamfers or inclines of the waists of boots and shoes, and also for burnishing black bottoms of boots and shoes.

The paring of the edge of the heel is effected by a disc-like rotating cutter, and the paring of the front of the heel by a rotating cutting blade or by a disc-like cutter, the boot or shoe being supported by a roller, and moved against the cutter by the workman. The edge of the sole is pared by a fixed adjustable cutter, the boot or shoe being guided and protected by a small guide roller. A rotating disc-cutter may be used instead of the fixed cutter. The chamfering of the waist of the boot or shoe is effected by an oscillating rasping or chamfering tool, a guide roller guiding the boot or shoe and preventing the tool injuring the upper leather. The finishing of the edges of the soles and heels and waists of the boots and shoes is effected by a series of heated smoothing or ironing tools, having an oscillating motion, the burnishing ends of the tools being made to rub against the required parts as the boot or shoe supported on a roller is carried against the said tools by the workman. By a change of tools the burnishing of a black bottom to the boot or shoe may be effected.

A.D. 1874, January 5.—No. 60.

WESTMACOTT, Percy Graham Buchanan, of Elswick, in the county of Newcastle upon Tyne.—"Improvements in hydraulic capstans and such like hauling machinery, partly applicable to mounting "hydraulic engines for giving motion to other machinery."

This Prol. Specification describes mounting hydraulic engines on the underside or back of a plate capable of being turned on hinges; the water under pressure and the exhaust if necessary is carried through the hinges. A capstan barrel or other machinery to be driven is mounted on the face of the plate. Or a chain wheel is mounted on the underside of the plate, and the chain is led out through a hawse hole and over pulleys. To hold the chain into gear with the chain wheel a pulley acted on by a hydraulic cylinder is used. When the chain is not in gear with the chain wheel it can be drawn out freely.

A.D. 1874, January 6.—No. 61.

MOLYNEUX, Echlin, of Gray's Inn, in the county of Middlesex, civil engineer.—"Improved apparatus "for extracting tea from the comminuted leaf."

The invention consists in apparatus adapted for enabling boiling water to be forced, by hydrostatic pressure, through a column of comminuted tea contained in a chamber having a bottom of fine wire or other gauze to strain the resulting liquor.

A.D. 1874, January 6.—No. 62.

RAWSTHORNE, Shadrach, of Preston, in the county of Lancaster, manufacturer, and **HARTLEY**, John, of the same place, manager.—"Improvements in size, and finishing yarn when sized."

The advantages derived by this invention are, a certain softness when sized and an adhesiveness to the material when sized, yet the yarn is very easily parted.

There is a likewise a great saving in breakage of yarn and cost of sizing.

The splitting rod placed in the position designed will part the yarn much easier than at a greater distance from the roller, and the fibre is better laid while the yarn is warm.

A.D. 1874, January 6.—No. 63.

QUIN, James, of Leyland, in the county of Lancaster.—"A new or an improved method for protecting india rubber valves, tubes, and other like articles from chemical action."

The novelty of this invention consists in rendering india rubber articles impervious to chemical action and yet retaining its elasticity, making it especially valueable in chemical works for tubes, and where mineral oils are used in valves and packings.

A.D. 1874, January 6.—No. 64.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from George Washington Morris, John Seilor Robinson, George Norbury Mackenzie, and Perry Espey Brocchus, all of the city of Baltimore, in the state of Maryland, United States of North America.*)—"Improvements in the "structure of furnaces, and the apparatus connected therewith for manufacturing iron and other metals "by the use of hydrocarbon vapour or gas combined with or without superheated steam, for heating "purposes."

My improvement consists in constructing and combining mixing and combustion chambers with smelting and puddling furnaces, for using hydrocarbon vapour or gas combined with air or superheated steam as fuel for heating purposes.

A.D. 1874, January 6.—No. 65.

KENNEDY, William, of Brighton, in the county of Sussex, gentleman.—"Improved apparatus or means "for supplying brushes with powder."

This apparatus is constructed with a hopper into which the powder is put, and also with a reciprocating rotating hollow measure which is made with openings placed so that when one is in communication with the hopper, the other is shut off from communication with a brush receptacle situated underneath, and vice versâ.

This receptacle consists of a casing formed to the general contour of the brush to be used therewith, but it is of greater heighth and projects beyond a casing hereafter mentioned, at which projecting ends it is made of a taper form.

At its rear there is centred a bell crank, one arm of which is acted upon by pushing the brush into its receptacle so as to cause its other arm, by a link connection, to effect a partial turning of the measure, which lets fall that which it contained on to the hairs of the brush, the tapering sides of which support the powder, and on its being withdrawn compress the powder on the brush.

Any surplus powder falls through perforations in the brush receptacle into an exterior casing which surrounds all but the hopper.

A.D. 1874, January 6.—No. 66.

BROWNE, Alexander, of the firm of Browne and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex. — (*A communication from Henry Francis Knapp, of New York, in the United States of America.*)—"An improved method and apparatus for raising sunken and wrecked "vessels."

The features of novelty of this invention consist in raising wrecks by means of chains passed under the vessels. These chains are slipped under the keel by the aid of bars combined with tubes into which water is injected so as to clear a passage before it in the sand. When a sufficient number of chains have been passed under the vessel they are attached to hydro-pneumatic jacks opened at the bottom. In these jacks air is forced by means of a force pump, and in raising they will bring up the wreck with them.

A.D. 1874, January 6.—No. 67.

LENOX, George Charles Lennox, of the firm of Brown, Lenox, & Co., of 8, Billiter Square, in the city of London.—"Improvements in apparatus for holding chain cables."

According to this Provisional Specification a chain cable as it rises from the locker is passed over a drum with teeth, so that the drum turns as the chain runs out. A break strap controls the drum. A portable claw chain holder is also described; the claw is mounted on an axis on which it is allowed to turn when it is desired to free the chain. The arrangements are such that the chain can be let go whatever be the strain upon it.

A.D. 1874, January 6.—No. 68.

HOLMES, Frederick, of Malvern Lodge, St. James's, New Cross, in the county of Kent, engineer.—"Improvements in machinery for polishing stone, marble, and other hard substances."

My invention of improvements in machinery for polishing stone, marble, and other hard substances consists of constructing a framework and bench with two trays one above the other and allowed to move at right angles to each other on the bench. On the top tray is placed the stone to be polished, over this is a box carrying the polisher and polisher holder which is worked backwards and forwards by means of a disk and connecting rod which is actuated by suitable belts from pulleys on the main shaft. The under tray is moved transversely by a screw in the bench and driven from the main shaft.

A.D. 1874, January 6.—No. 69.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Daniel Thomas Casement, of Painesville, in the county of Lake and state of Ohio, United States of America.*)—"Improvements for the more effectual combustion of fuel and generation of steam in "furnaces, partly applicable to other fire places."

This invention relates to a method of improving the combustion of fuel in all kinds of furnaces, stoves, grates, and ranges, for the prevention of smoke, and for obtaining increased heating power, which results are attained by the employment of a mass of balls or blocks arranged in a layer above an ordinary grate bed, on a secondary grate, (having a water circulation if necessary,) one or other of said grates being also arranged to rise and fall for putting on the fuel where required.

The products of combustion are quickly consumed on coming in contact with and permeating the mass of heated balls or blocks, which also serve for storing and radiating the heat abstracted from said products of combustion and increasing the generation of steam.

A.D. 1874, January 6.—No. 70.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Daniel Thomas Casement, of Painesville, in the county of Lake and state of Ohio, United States of America.*)—"Improved apparatus for regulating the pressure and friction of fluids."

This invention consists of a lift valve with adjustable or variable weights and a diaphragm, arranged in a vertical pipe or case (having a removable cap or plug to afford easy access to the valve), in combination with the supply pipe connecting with the fluid source and the delivery pipe, for regulating, controlling, and limiting the pressure and friction of fluids.

Also the combination of two or more regulators and a special branch and cock with the supply pipe and the delivery pipe, for the discharge of different currents of different pressures from a constant source, or one current of constant or nearly constant pressure from a variable source by differently weighted valves.

A.D. 1874, January 6.—No. 71.

HARRINGTON, John, of Ryde, Isle of Wight, gentleman.—"Improvements in the treatment of the "'splits' and 'fleshes' of skins or 'hides,' and of 'buffed leather' and of leather or skins, the grain of "which is imperfect, in order to render them suitable to be employed for most purposes to which good "surfaced leather is applied."

The invention consists in applying a surface of paper or woven fabric to the "splits" and "fleshes" of skins or "hides" and "buffed leather" and to other skins the grain of which is imperfect, said paper or woven fabric being dyed or coloured to the tint required, and grained by means of fac-simile moulds.

A.D. 1874, January 6.—No. 72.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Charles H. Phillips, of the city and state of New York, United States of America.*)—"An improved process for preparing hydrate of magnesia."

This invention consists first in preparing a pure superhydrate of magnesia by subjecting a soluble salt of magnesia to the action of a caustic alkali, and second in preparing a medical compound consisting of a superhydrate of magnesia mixed with water and termed "milk of magnesia."

A.D. 1874, January 6.—No. 73.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Jules César Timothée Mousserron, of Paris, in the Republic of France.*)—"Improvements in "warming railway carriages, and in the apparatus or means employed therein."

This invention relates to a mode of and apparatus for separately warming railway carriages by the aid of warm air obtained by the combustion of charcoal or other fuel in specially constructed fire places situate either beneath or on the side of the carriage and combined with a peculiar arrangement of tubes for carrying off the products of combustion, and for supplying fresh warm air to the interior of the carriage through open mouth pieces situate underneath the seats, or into a receiver covered by a grating and extending the full width of the carriage between the seats immediately underneath the feet of the passengers.

A.D. 1874, January 6.—No. 74.

STEEL, James, and McINNES, John, both of Glasgow, in the county of Lanark, North Britain, engineers.—"Improved apparatus for actuating the brakes of railway trains by compressed air, part or par "of which are also applicable for signalling in railway trains."

The features of novelty which constitute this invention are:—

First. The method of applying the air for operating the brake apparatus so that it is constantly acti throughout the trains.

Second. The arrangement and construction of the apparatus for operating the brakes either by the expa sion of compressed air or by springs.

Third. The system of signalling throughout trains.

A.D. 1874, January 6.—No. 75.

WILSON, Seth Wyle, of Philadelphia, Pennsylvania, United States of America, now of Lombard Street in the city of London, civil engineer.—"Improvements in electrical-brake apparatus for railway purposes."

aid invention relates to improvements in portions of the electrical apparatus for operating railway described in the Specification of Letters Patent bearing date the 13th December, A.D. 1870, 56. An important part of the said apparatus is a contrivance for putting on and releasing the brakes, ich consists chiefly of a friction plate provided with electro magnets in connection with a battery and ature plate. According to my present invention I modify the above apparatus and provide a more t and economical electric clutch.

A.D. 1874, January 7.—No. 76.

SON, John Cresswell, of the town and county of the town of Nottingham.—" Improvements in lace machines."

patentee obtains the requisite movements of the catch bars and point bars by means of links and some of which rock upon and others are secured to two shafts or spindle bars, the whole of the levers rated by cams on a cam shaft lying between the first named shafts: said cam shaft has a crank and each end, which drive quadrants which operate the catch bars.

A.D. 1874, January 7.—No. 77.

RELL, John, of Dame Street, Dublin, Ireland, manager of a public company.—" Improvements in icial stone pipes and tubes, and in the coating or lining thereof to render them suitable for the uit of alkaline liquids and acid products from chemical, manure, and gas works, for sewage, saline ds, and gas."

invention relates to pipes and tubes of artificial stone, for which I have obtained Letters Patent on th of September 1873, No. 3086.

the conduit of gas I line the interiors and ends with a coating of silicate of soda in a crude state by g such parts with a strong solution of the substance and allowing it to dry slowly. Any other silicate or aluminate may be employed or a mixture of them.

the conveyance of sewage, the tubes or pipes should be smoothly turned within, and when so arranged be coated internally with a thin but perfect layer of bitumen laid on hot and diluted with some oil r to lower the fusing point so as to ensure complete union with the bitumen, agglutinating the par-f stone.

acids the mineral basis of the tubing as described in my Letters Patent, No. 3086 above referred to ed and the natural bituminous rock omitted from the composition, and one of the following sub-s employed for the crushed limestone:—

ny sample of burnt clay or shale which is not acted upon by an acid.

ea or river sand free from matters soluble in muriatic acid.

rushed granite.

rushed flints or other forms of silica obtained by heating the flints to redness and quenching in water, they are readily crushed and powdered.

arthy minerals unacted on by acids.

es intended for saline or alkaline liquids should be made of burnt clay and bitumen, but pipes of the ry composition described in my former Patent are likewise serviceable for the purpose.

A.D. 1874, January 7.—No. 78.

SLEY, John, of Preston, in the county of Lancaster.—" A new and compound engine for the working ll kinds of machinery."

s engine is designed to save boilers, boiler space, and fuel, by a combination of steam with hydraulic . The steam power required is very small, yet sufficient to exercise great influence on the hydraulic by means of a series of small force pumps that take but little power to drive.

A.D. 1874, January 7.—No. 79.

IWELL, George, of the Junior Army and Navy Club, Pall Mall, in the city of Westminster, Captain Bombay Staff Corps.—" Improvements in the production of agents for giving or restoring colour to mproving the appearance of the human hair."

alt of iron is used with salt of zinc or other substance which does not stain the scalp. Sulphate of ides of iron with sulphate of zinc dissolved in distilled water is recommended.

A.D. 1874, January 7.—No. 80.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Edwin F. Allen, of Providence, Rhode Island, United States of America.*)—"An improved adjustable or fast and loose pulley."

The said invention relates to an improved adjustable pulley or wheel and consists in the combination of a friction spring, a griping-bar, a shipper-sleeve which has a taper-bar and disc with a pulley which has an inner and outer rim, in such a manner that by the movement of the said shipper-sleeve, the inner rim of the said pulley is compressed by the friction spring and holds it firmly, so that the disc to which the friction spring is inseparably attached is caused to revolve with the said pulley, and impart the required motion to the machinery or apparatus with which it is connected.

A.D. 1874, January 7.—No. 81.

DE VOGT, Henric Christian, of Copenhagen, Denmark, but at present residing at Govan, in the county of Lanark, North Britain, civil engineer.—"Improved apparatus for navigating the air."

In carrying out the invention a combined elevating or supporting and propelling instrument is used consisting of a horizontal frame fitted with a series of slats or feather planes which when closed fill up the entire extent of the frame. The feather planes turn on transverse horizontal axes at the forward edge of each. The horizontal frame is connected to a piston in a cylinder fixed vertically in a steam boiler. When the frame moves up, the feather planes assume inclined positions and act on the air so as to impart a forward impulse to the apparatus, and during the downward stroke the feather planes become close and by pressing downwards on the air have an elevating and supporting action.

A.D. 1874, January 7.—No. 82.

FOX, Frederick William, of Cross Banks, Shipley, near Leeds, in the county of York.—"Improvements in machinery or apparatus for combing wool or other fibrous substances."

This invention consists in the use of combs or gills applied and operated in such manner as to cleanse wool or other fibres without the use of the ordinary circular combs, or such combs are so used and applied as to cleanse wool or fibre preparatory to its being further operated upon by ordinary circular combs.

A.D. 1874, January 7.—No. 83.

BRAMALL, Sidney, of Fallowfield, and **GROVES, Frederick**, of Manchester, both in the county of Lancaster.—"An improved double acting and continuous brake for railway carriages and wagons."

First. This invention consists in an improved mode of connecting the brakes of the carriages or wagons so that when the carriages or wagons are turned from end to end there shall be no difficulty in connecting them. Instead of having a socket at one end of the shaft under the carriage and a square rod at the other end there is a socket at both ends having in them square rods with discs at their outer ends, which discs are connected together by pins or bolts having knuckle joints or flaps.

Secondly. In working the brake levers and brake blocks by a slotted eccentric on the shaft under the carriage, or by a lever, by a slotted link, or by a chain wheel and chains; and,

Thirdly. In the employment of a steel lever on each cross or brake shaft strong enough to block the wheels and yet have elasticity sufficient to allow the continuous shaft to have control over those carriages whose brake blocks may be more worn than others.

A.D. 1874, January 7.—No. 84.

BROOKES, William Henry, of Birkenhead, in the county of Chester.—"Improvements in pumps."

In constructing a plunger or ram pump according to this invention the ram or plunger is made hollow and fitted with a valve and guard at its foot. This valve opens out from the interior of the ram or plunger and forms the suction valve of the pump. A suitable distance up the hollow ram there is a through slot of length corresponding with or rather more than the stroke of the pump and of width corresponding with the diameter of the suction pipe which enters the barrel of the pump opposite the slot and a suitable distance up the pump. The plunger or ram is fitted below the through slot with spring packing rings which are placed round the plunger or ram and between the valve at the foot of the plunger or ram and the through slot. The delivery or discharge valve of the pump is fitted at the foot of the pump and may be of any suitable form. The pump is provided with a suitable packing gland for the ram, if found necessary, also with connecting rod and suitable working gear.

A.D. 1874, January 7.—No. 85.

MARSHALL, James, of Gainsborough, in the county of Lincoln, engineer.—" Improvements in thrashing machines."

This invention relates to improvements in the corn cleaning apparatus of thrashing machines.

For this purpose a series of adjustable knives are mounted upon longitudinal bars attached to centres fixed on the axis or spindle of the corn cleaner. The knives may be made either of steel, malleable iron, or other materials, and are fixed on to a square bar and arranged for the shanks to swivel thereon. The swivelling motion of the knives is obtained by moving a second bar to which the outer edges of the knives are connected parallel with the bar on which the knives swivel. Thus a longitudinal motion of the second bar swivels the knives into any position to suit the grain to be operated upon.

When steel blades are employed, either a coupling link is introduced, or a tang is rivetted on to each knife blade, in which arrangement the moving bar is formed with slots in place of pins, as previously described.

A.D. 1874, January 7.—No. 86.

CAIN, Thomas, of Lake Douglas, in the Isle of Man, engineer.—" Improvements in and in connection with hollow bars for furnaces or fire-grates."

The chief features of novelty in this invention are—

(1.) The construction of fire bars having two or more holes or passages running longitudinally for the purpose of connecting with hollow upper and lower chambers.

(2.) The hollow upper and lower chambers before mentioned, and the placing of the same in some cases at or near the centre of the hollow fire-bars.

(3.) The construction of the fire-bars, the end pieces, and the hollow chambers with holes to facilitate cleaning; and the providing of these holes with screw plugs or other stoppers.

(4.) The use of condensed water from a surface condenser for circulating in the bars.

A.D. 1874, January 7.—No. 87.

CORKRAN, John Frazer, of 110, Cannon Street, in the city of London.—(*A communication from Andrew Archbald, residing at Florence, in the Kingdom of Italy.*)—" An improved manure."

This manure is composed of pine wood, sawdust, and animal blood, mixed and dried as soon after the animal is slaughtered as possible.

A.D. 1874, January 7.—No. 88.

DAVIES, David, of Crumlin, in the county of Monmouth, civil & mechanical engineer.—" Improvements in steam-boilers."

The novelty in this case consists in forming steam-boilers of separate duplicate independent sections, and grouping them together to suit any position or desired form or shape and may be so arranged as to form their own fire-box. Also in erecting circular or cylindrical sectional boilers over and upon those formed into square or rectangular boilers.

A.D. 1874, January 7.—No. 89.

CRUICKSHANK, Arthur Benjamin, of Messrs. Gourlay, Bros., Iron Ship Building Works, of Dundee, in the county of Forfar.—" Improvements in cleats for holding the sheets in sailing boats."

The object of this invention is the construction of a self acting safety cleat for holding the sheet in a sailing boat in such a manner as to yield to a strong puff of wind and so avoid risk of capsizing the boat.

A.D. 1874, January 7.—No. 90.

BARLOW, William Henry, junior, of 2, Old Palace Yard, in the city of Westminster.—" Improvements in pens."

This Provisional Specification describes forming a writing pen of four or other number of stalks or wires, or needles, fixed at one end, at distances apart from one another, to a socket piece or base, and at their opposite ends brought together to a point so as to form a conical pen, the apex of which will form the writing point.

A.D. 1874, January 7.—No. 91.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from "The Bradley Window Company," of New York, in the United States of America.*)—" Certain new and useful improvements in the construction of windows for ventilating cars, " dwellings, steamboats, and other like places, and in attachments thereto."

This invention relates to windows constructed in addition to the ordinary sliding sash with an adjustable inner sash or frame in which the glass is set, and which is so connected with the outer sash that it may be inclined from the plane of the window in either direction, or may be projected outwardly from the plane of the window in a plane parallel therewith or inclined vertically thereto as circumstances may require, and is so connected with the window sash as not to prevent the raising and lowering of the windows.

The said windows may be provided also with a hood, cap, or guard attached to the window above the adjustable sash to prevent rain, snow, or dust from entering at the top of the window.

They may also be provided with a flexible curtain or apron to prevent the air from entering at the top of the adjustable sash, and with moveable or adjustable perforated screens and other devices.

A.D. 1874, January 7.—No. 92.

BLAKE, Charles Edward, of San Francisco, California, in the United States of America, dentist.— " Improvements in dentistry, the same consisting in a means of disguising the bright color of gold filling " for teeth, whereby said filling is also rendered more durable; and also of an improved metallic foil for " dental purposes."

This invention relates—

Firstly. To a filling for teeth, consisting of the usual base covered with a stratum of platinum or other metal approximating to the color of the enamel of the teeth.

Secondly. To a chemical admixture or alloy of platinum and gold for the purpose of providing an improved dental gold.

Thirdly. To a new article of manufacture for dental purposes, consisting of platinum foil or leaf, coated with gold either upon one or both sides by the electroplating process or otherwise.

A.D. 1874, January 7.—No. 93.

WEBSTER, James, of Birmingham, in the county of Warwick, engineer.—" Improvements in mounting " and working converters employed in the manufacture of steel and other metals."

This invention refers to certain improvements upon a former invention for which Letters Patent were granted to the present inventor, dated May 26th 1870, and the present improvements chiefly relate to the construction of a travelling carriage or mount capable of being advanced up to and withdrawn from the converter as required, the object being to dispense with a fixed cover to the tuyere box, and to have ready access to the same at any time either for inspection or repairs.

A.D. 1874, January 7.—No. 94.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from James Bennett Stone, of Boonton, in the state of New Jersey, United States of America.*)—" Improvements in electro-magnets, and in the application of the same for obtaining " motive power."*

The invention consists of a combination of fixed and moveable magnets constructed with channels or corrugations on their faces in courses parallel to the direction of motion, and in a construction and arrangement of parts whereby the contiguous fixed and moveable magnets, when magnetic and attracting each other consecutively are made to resemble, as regards their action, V shaped magnets with the opposite poles attracting each other, and with the one pole fixed and the other moveable.

A.D. 1874, January 7.—No. 95.

ANDREWS, William, of Birmingham, in the county of Warwick, machinist.—" Improvements in " sewing machines."

The object of this invention is to reduce the number of parts employed, and to secure an efficient action of the improved portions.

The invention refers to an improved needle arm, presser foot, and their attendant parts, to be applied to several descriptions of sewing machines. Also to an improved shuttle arrangement for shuttle machines.

A.D. 1874, January 7.—No. 96.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Robert Henry Thurston, of Hoboken, New Jersey, United States of America.*) —"An improved apparatus or machine for testing and registering or recording the strength, elasticity, and " ductility of wood, iron, and other materials."

This invention is embodied in an apparatus in which the strain to be applied to test the strength or elasticity of any material is transmitted through the piece to be tested by two independent opposing forces, one of which, in combination with a stationary guide, gives a movement to a pencil-holder and pencil, and the other gives a movement to a table covered with a paper similar to that used in taking indicator diagrams from a steam engine, whereby in the performance of the test of the material, the differential movement between the paper and the recording pencil, induced by the yielding of the fibres of the piece which is being tested to the strain applied to it, shall express the quantities of strength, elasticity, or ductility which the material tested possesses.

A.D. 1874, January 7.—No. 97.

MURDOCH, Hunter Henry, of No. 7, Staple Inn, in the county of Middlesex, patent agent.—(*A communication from Auguste Louis Joseph Lesage, of Brussels, in the Kingdom of Belgium, chemist.*)—" Improve- " ments in the process of obtaining potash from the 'yolk' of wool, and from the residuum of the " distillation of beet-root juice or of molasses, and in apparatus for the same, which improvements are also " applicable to the recovery of soda from the lyes of paper pulp."

This invention consists of improvements in the treatment of the "yolk" of wool and the residuum of the distillation of beetroots and molasses in order to obtain potash therefrom, and of apparatus and furnaces for such treatment. The liquor to be operated on is subjected to evaporation by being made to pass through a series of evaporating pans or boilers; it then enters a preparatory furnace, from which it passes into an incinerating furnace in which the potash is obtained. The potash is then removed to a cooling chamber or building formed on three sides by double perforated walls with an air span between them, and closed on the other side by a door, the floor being made of bars or girders sufficiently far apart to allow of a circulation of air.

The first evaporating pan or boiler is mounted above the preparatory and incinerating furnace, and is heated thereby. The incinerating furnace, which is constructed next to the preparatory furnace, is heated by a suitable fire grate or furnace, which also heats one of the evaporators; a second fire grate or furnace gives heat to another evaporater, and also consumes the volatile products of combustion from the incinerating furnace, which products of combustion first traverse the preparatory furnace. Other evaporators are heated by separate fire grates or furnaces. The flues from all the fires open into a terminal flue heating the last of the evaporators, in which flue the products of combustion from the different sources mingle and are consumed.

A.D. 1874, January 8.—No. 98.

MILLER, Joseph A., of Providence, state of Rhode Island, United States of America.—(*Partly a communication from Joseph R. Brown, of New Haven, Connecticut, U.S.A.*)—" Improvements in rendering, purifying, " and bleaching tallow, lard, and other fatty matter."

The first part of this invention is designed to prevent the offensive odours which make the rendering of tallow, lard, or other fatty matter a nuisance. The second part of the said invention is designed to purify and bleach the tallow, lard, or other fatty matter after it has been rendered, and to remove all cellular tissues, glutinous, albuminous, and coloring or other foreign matter, and bleach the same to produce an article free from all impurities.

A.D. 1874, January 8.—No. 99.

MASON, Thomas, type mould maker, No. 14, Cross Street, Islington, in the county of Middlesex.—" An " improved lead or type metal stereotype block for mounting and fastening stereotype and other similar " plates on."

The present well known lead stereotype block is cast with a layer of iron or other hard metal on the surface or otherwise. The iron is perforated with tapped holes or slotts for fixing the fastening screws and nuts into, and may be less in width and length than the block.

And I claim the lasting, methods of affixing, combination, and use of iron or other hard metal (on the surface or otherwise) with lead or type metal for making stereotype blocks and other lead castings, thereby adding strength, and for the catch screws, nuts, and bolts used in fastening stereotype and other similar plates on the blocks to work in and hold by, and other parts of lead castings subject to friction.

A.D. 1874, January 8.—No. 100.

RAY, Antoine, Grove House, Clapham Common, S.W.—(*A communication from André David, of Saint Etienne, Loire, France.*)—" A new process for obtaining in virtual effects or motions, the animation of drawn " figures by the help of two images combined in order to represent the two extreme positions of a motion " appearing and disappearing in turn before the eyes."

The animation is obtained by means of the alternate appearing and disappearing of the two images drawn on purpose, with the aid of a stereoscope furnished with a screen, and screens furnished with coloured transparents.

A.D. 1874, January 8.—No. 101.

REYNOLDS, William Francis, of Nightingale Lane, London Docks, in the county of Middlesex, nautical instrument maker.—" Improvements in ships' compasses, and in means for regulating or adjusting " the same and other compasses thereby."

1. In this invention, the bowl which carries the compass card is fixed to and oscillates with the ship instead of being swung in gimbals as heretofore.

2. The lubber line is hung on a pivot and preserves a vertical position however much the ship rolls.

3. The card is floated so that it is only just heavy enough to sink and is painted or marked on its outer edge.

The centre is formed by a plain parallel pin passing through a collar or ring, formed by preference of a stone or jewel, such as is used for time pieces.

A.D. 1874, January 8.—No. 102.

WOODLEY, John Frederick Potter, of Rose Villa, Moor Street, Burton-on-Trent, in the county of Stafford, cooper, and **ANDERSON, John**, of High Street, in the said Burton on Trent, gentleman.—" Improvements in machinery employed in the manufacture of wood casks."

The invention relates to apparatus for cutting the edges of staves to the desired shape, or the process commonly called jointing.

For this purpose each stave is successively placed on a table, on or in a groove of which an endless chain traverses with projections, one of which by acting on one end of a stave drives it forwards between a pair of radial shafts, or shafts at angles one to the other, carrying cutters to produce the desired angle to the edges. The relative position of the shafts is variable by right and left hand screw motion by which these angles may be varied. These shafts are supported in a frame capable of movement transversely to that of the stave, to adapt the cutting to variations in width of the stave. These motions are effected by cams or tappets, and rotation to the cutter shafts by straps or bands.

A saddle piece operated by the attendant and a stationary roller aid in guiding the stave to the cutters, whilst weighted lever arms with rollers hold the stave during the cutting.

The invention also relates to apparatus for hollowing the inside surface of the staves. For this purpose each stave is as in the last apparatus placed on a table so as to be acted upon by one of a series of projections from an endless travelling chain, by which it is moved into position to be cut by rotary cutters driven by band or strap, and is guided whilst moving forwards by a template or roller or rollers.

Weighted guides and a weighted pressure roller guide and aid in holding each stave in position during its traverse.

The cutting of the outer surface or " backing " of the staves is effected by each stave being moved forward by a similar endless chain on a table, so that the outer surface of such stave may be acted upon by other rotary cutters, the motion of the staves being aided by weighted pressure rollers and guides.

The invention also relates to means for effecting the desired bevelling of the edges of the heads of casks: pieces of wood jointed together to form a head are placed between, and so as to be held by pins between two plates capable of sliding sideways on other face plates. The axes of one of these face plates is hollowed to receive through it the axis or spindle of its sliding plate. Rotary motion is given to this hollow shaft to cause the rotation of the several plates, and the "head" held between them, but during this motion other motion is given to the axis or spindle to the sliding plate carried by the plate affixed to that hollow shaft, so as to cause the head to revolve in an oval direction so that its edge may be cut by the bevilling cutters to an oval form capable of adjustment as to extent.

The cutters are supported in slide rest for adjustment.

The invention also relates to means for planing the edges of the separate breadths of wood to form the "heads."

For this purpose a table and endless chain such as before referred to are employed to conduct the pieces between a pair of rotary cutters, and the distance apart of the axes of these cutters is regulated to the width of wood under operation by a pair of pins or projections carried by frames operated by right and left handed screw, such frames also carrying the axes of the cutters.

A.D. 1874, January 8.—No. 103.

WILLIAMS, Daniel, and GURR, John, both of Egbert Street, St. George's Road, in the county of Middlesex.—"Improvements in the construction of anchors."

The chief objects of our invention are to simplify the construction of anchors, and to render them more efficient in taking and holding the ground.

The improvements consist in an improved and simple method of forming and arranging the arms and crown of the anchor in combination with the shank thereof, and in order to distinguish the same from other previous methods or forms of construction we intend to designate anchors constructed according to our improved method as "trunnion anchors."

A.D. 1874, January 8.—No. 104.

DAVIES, David, of Mansfield, in the county of Nottingham.—"Improved apparatus for regulating the "speed of steam engines."

This invention consists principally in attaching a screwed rod to the steam valve and in so connecting such screwed rod with a sliding bush on the "governor" spindle, that as the arms of the governor expand the valve is screwed down or closed, and as the said arms collapse or fall the valve is screwed up or opened.

A.D. 1874, January 8.—No. 105.

ATKINSON, James, of 22, Stonefield Street, Islington, London, engineer.—"An improved cap or head "dress for travelling or resting the head."

The invention consists of a cap or head dress having an air cushion or cushions surrounding or enclosed in it, which may be inflated at pleasure.

A.D. 1874, January 8.—No. 106.

NEWTON, Robert, of Lower Providence Mill, Keighley, in the county of York, engineer.—"Improvements in fire bars and apparatus connected therewith."

This invention relates to the construction of fire bars having a circulation of water therethrough and to the apparatus employed for supporting the said bars and for securing a provision for the required circulation of water through the said bars.

A.D. 1874, January 8.—No. 107.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Emile Cornely, of Paris, France.*)—"An improved embroidering and "braiding machine."

The novelty of this invention lies in a system of disc turning in the centre of the needle-hole, in connection with a braid-carrier and a reel-carrier, which are placed in combination with the known parts of the machine known as the "Bounaz Couso-Brodeur," to produce a braiding with the stitching on the braid.

A.D. 1874, January 8.—No. 108.

VERNON, William John, of the Belle Vue Mineral Water Works, Crewe, in the county of Chester. —"Improved means for effecting the closing or stoppering of aerated liquid bottles having internal "stoppers."

This invention has for its object to facilitate the closing or stoppering of aerated liquid bottles having light internal stoppers, for example, stoppers consisting of a vulcanized india rubber washer fixed on a light spindle, stem, or cylinder, the specific gravity of the entire stopper not exceeding the specific gravity of the liquid in the bottles. Such bottles whilst being charged with aerated liquid in a bottling machine are for this purpose usually inverted or turned with their necks downwards, but their stoppers being comparatively light do not when the bottles have been charged sink or fall into their proper positions for closing the same.

Now this invention consists in effecting the closing or stoppering of such inverted bottles as aforesaid by attaching or connecting to the stopper before placing the bottle in the filling or charging machine a closing device of such specific gravity, that the weight of the stopper and closing device combined shall exceed the specific gravity of the liquid contained in the bottle, thereby causing the stopper to descend and (guided within the orifice of the bottle's neck by the spindle and closing device thereto attached) to assume the proper position for closing or stoppering the orifice in the bottle, in which position the stopper will be retained by the pressure of the gases within the bottle. The weight or device may then be removed from the spindle stem or cylinder of the stopper, and applied to the stopper of another empty bottle and so on.

A.D. 1874, January 8.—No. 109.

NEGRETTI, Henry, and ZAMBRA, Joseph Warren, both of Holborn Viaduct, in the city of London, meteorological instrument makers.—"Improvements in thermometers used in deep sea soundings and for "other purposes."

The object of the present invention is to construct a self registering thermometer which may be used in deep sea soundings, or in other places not easy of access, whereby the correct temperature at any desired depth or position may be obtained without the slightest risk of error.

A.D. 1874, January 8.—No. 110.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Desiré Lambert, a person resident at Marcinelle, in the Kingdom of Belgium, engineer.*)—"Improvements in the "construction of coal small waggons."

The invention consists in making in one single piece the two wheels and axle-tree of the small waggons for conveyance of coal in coal pits.

A.D. 1874, January 8.—No. 111.

CLARK, Josiah Latimer, and STANDFIELD, John, both of 5, Westminster Chambers, Victoria Street, Westminster.—"Improvements in floating docks and pontoons."

This Specification describes constructing the dock or pontoon of a series of circular or nearly circular tubes placed parallel to each other, either longitudinally or transversely connected with similar vertical tubes at their ends or sides.

A.D. 1874, January 8.—No. 112.

FARQUHAR, John Frederick Cooke, of 24, Long Acre, in the county of Middlesex.—"Improvements "in gas burners."

This Provisional Specification describes a burner of the argand class with two or more concentric rings.

A.D. 1874, January 8.—No. 113.

LAZENBY, James, of 6, The Exchange, Market Street, Bradford, in the county of York.—"Improvements "in umbrellas, parasols, and sunshades."

This Provisional Specification describes an apparatus for binding the ends of the ribs to the handle when the umbrella is closed.

A.D. 1874, January 8.—No. 114.

HOLDEN, JONATHAN, and HOLDEN, JOHN EDWARD, residing at Reims, France, manufacturers.—"Improvements in machines for washing wool."

This invention describes machines for washing wool by means of a rotating cylinder armed internally with points, the said points by means of an eccentric being withdrawn and inserted at intervals so at to seize the wool, alternately submerge it in the water, and release it.

Also in a means of conveying the wool from end to end of the vat by horizontal shafts with curved arms, their rotation plunging the wool into the water and also causing it to progress uniformly; also to the arrangement and construction of the discharging apron.

A.D. 1874, January 8.—No. 115.

COX, WILLIAM, of Camperdown Linen Works, Lochee, in the county of Forfar, North Britain, manufacturer.—"An improvement in sacks or bags."

The feature of novelty which constitutes this invention is the insertion of one or more cords between the stitched portions of sacks or bags.

A.D. 1874, January 8.—No. 116.

ROBERTSON, JOHN, of Nitshill, in the county of Renfrew, North Britain, engineer.—"Improvements in "indicating and registering the number of persons who enter and leave tramway-cars, omnibuses, public "halls, steamboats, or other places of public resort, and in the apparatus or means employed therefor."

The features of novelty constituting this invention are,—the arrangement of the platform and its operating one or more fingers or pointers, also the cards on which the number of persons entering a tramway car or other vehicle are registered by marks or punctures.

A.D. 1874, January 8.—No. 117.

LIGHBODY, WILLIAM, of Bow, in the county of Middlesex.—"Improvements in lamps."

This invention relates to an improved means of supplying air for supporting combustion to the burners of lamps for burning paraffine and other hydrocarbon oils, whereby the ordinary chimney may be dispensed with; and consists essentially in the employment of a tube of wire gauze or perforated metal surrounding the wick tube, through the perforations of which tube the air is supplied to the burner.

A.D. 1874, January 8.—No. 118.

MARSHALL, WILLIAM, and CROSSKILL, THOMAS ALFRED, both of Hull, in the county of York.—"An improvement in wringing and mangling machines."

The bearings of the top roller are provided with india rubber cushions which convey an elastic or yielding pressure to the roller, the india-rubber being made with one or more vertical openings to increase its elasticity.

A.D. 1874, January 9.—No. 119.

HAMILTON, JAMES BAILLIE, of University College, Oxford, Esquire.—"Improvements in the construction "of musical instruments."

The connection of a string with a free reed so that they may be enabled to sound inwards.

A.D. 1874, January 9.—No. 120.

FLEMING, GILBERT STANTON, of 481, Oxford Street, in the county of Middlesex, manufacturer.—"Improvements in apparatus applicable to candles when burning."

A cap of metal, porcelain, glass, or other material is applied to the top of the candle so as to form an enclosure round the wick and upper part of the candle, such cap being formed with an internal shoulder to rest on the top of the candle, and with a flange at the bottom to give it sufficient weight to cause it to descend as the candle becomes consumed.

A.D. 1874, January 9.—No. 121.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from William Painter, of the city and county of Baltimore, state of Maryland, United States of North America.*)—" Improvements " in pump valves."

My improvement consists in constructing pump valves of elastic material, so as to permit the passage of substances through the valves equal in size to the shape or area of the valve opening, without choking or preventing the proper working of the valves at all times.

A.D. 1874, January 9.—No. 122.

DYSON, George Walter, of the firm of Dyson and Hall, of the Carbrook Forge and Rolling Mills, Tinsley, near Rotherham, in the county of York.—" Improved means of and apparatus for rolling metals " and other bodies or substances."

This consists of a rack, single or double, working into or between pinions or wheels when driven by one or a pair of cylinders or rams direct or through the intervention of gearing, the pinions or wheels being in connection with the rolls by which the metal or other body is reduced.

A.D. 1874, January 9.—No. 123.

HEDLEY, George Henry Carne, 87, Pool Street, Wolverhampton, Stafford, engineer.—" An improved fire-lighter."

The features of novelty of this invention are:—The forming a fire-lighter with pieces of wood, moving on a centre, into a star or fan-shape, to expand its burning surface, give quick ignition, and, also, to allow it to fold together into a bundle, for the convenience of packing closely into boxes or cases, for stowage or exportation; also, the dipping of the ends of the pieces of wood into my inflamable composition of rosin and coke or coal-dust, or into rosin only; not cementing the pieces of wood together, but keeping them all detached and independant of each other.

A.D. 1874, January 9.—No. 124.

TRUMAN, Edwin Thomas, of Old Burlington Street, in the county of Middlesex.—" Improvements in " the manufacture of insulated telegraphic conductors, and in machinery for their manufacture and for the " preparation of the materials therefor, parts of which machinery are applicable to other purposes."

This Provisional Specification refers to a former patent, No. 482, of 1872, for a process and machinery for covering wire with insulating material, and describes means of imparting rotation to the wire without giving any rotation to the receiving drum except the ordinary axial rotation.

The Provisional Specification also describes a mode of and apparatus for forming a perfectly solid covering to those portions of the wire which form the union between the various lengths in which the covered wire is necessarily made.

It also describes the employment in the machines usually termed covering machines of two screws, one in a hopper and the other in a casing which is supplied by the hopper. The combined action of the two screws causes the material to issue regularly and uniformly by the outlet of the casing, which may communicate with a tube or die, through which the wire to be covered travels.

It also describes means of entirely or partially closing at will all or some of the openings in the cylinders of machines for washing and cleansing gutta percha and other analogous materials, the object being to render the escape of material in the raw state or in small pieces, and before agglomeration has taken place, (which is the case with existing machines,) impossible.

A.D. 1874, January 9.—No. 125.

PINDAR, William, and **PINDAR, Asher Graham**, both of the city of York, in the county of the said city of York, wire manufacturers.—"Improvements in 'silk' machines for dressing flour, part of such "improvements being applicable for sieving or sifting other powdered or pulverized material."

This consists in giving to silk sieves for sifting flour and other powdered or pulverized material an intermittent reciprocating motion in combination with the usual rotary motion, the intermittent reciprocating motion being produced by crank, eccentric, or cam, caused to revolve by suitable gearing.

A.D. 1874, January 9.—No. 126.

POOLEY, Henry, the younger, of Liverpool, in the county of Lancaster, and **GREENWOOD, John**, of Manchester, also in the county of Lancaster.—"Improvements in self indicating weighing machines."

The improvements in self indicating weighing machines according to this invention consist in fixing or attaching a circular tube of gutta percha or other suitable material to the revolving dial of the weighing machine. This circular tube is partially filled with mercury or other suitable fluid. Inside the tube there is fixed a chain or cross bars, or other suitable contrivance for the purpose of breaking up the mercury or other fluid that is contained in the said tube, thereby retarding or checking its vibration.

A.D. 1874, January 9.—No. 127.

MACNAB, William, of Greenock, in the county of Renfrew, North Britain, engineer.—"Improvements "in steam boilers."

In one modification the improved boiler comprises six horizontal cylindrical shells arranged in two connected horizontal rows of three each. The lower cylinders have also connected to them at their undersides tubular legs, those of the several cylinders being connected by transverse tubes at the bottom. The lower cylinders are fitted with flue tubes which are arranged so as to leave a space along the middle of each cylinder for admitting a man to easily examine and clean any part. The furnaces are arranged at one end of the lower cylinders, and the fire gases pass thence along under the lower cylinders to their back ends, whence they return through the tubes in the lower cylinders to the front ends next travelling towards the back end between the lower and upper cylinders.

A.D. 1874, January 9.—No. 128.

WOODWARD, Joseph, of Darlington, in the county of Durham.—"Improvements in the manufacture "of blocks or slabs for paving, and in apparatus employed in such manufacture; which improvements are "also applicable for the manufacture of pipes and tiles for sewage and draining."

This invention consists, firstly, in making blocks for paving roads and slabs for footpaths and curbs, as well as pipes and tiles for sewage and draining from the molten refuse, slag, or scoria which exudes from blast furnaces employed in the smelting of iron or other ores.

Secondly, in the employment of an endless chain of travelling moulds for receiving such refuse, slag, or scoria, moulding the same into form and delivering the blocks, slabs, pipes, or tiles when moulded and set.

And, thirdly, in an arrangement of travelling platform onto which the moulded blocks or other articles are delivered, and which travelling forward very slowly carries the same through an annealing chamber or furnace and delivers them properly annealed at the other end.

A.D. 1874, January 9.—No. 129.

BENNETT, Thomas Shaw, of Newton Heath, in the county of Lancaster.—"Improvements in the con"struction of pickers used in looms for weaving."

Instead of punching a piece out of the picker to pass the picking strap through I merely make two longitudinal slits in the hide and I then press the strip which is between these two slits outwards so that it forms a bar or staple round which the loop of the picking strap is passed and as this bar is in a level with and not above the spindle the " pull " of the strap is much more direct, the picker runs easier, and the holes through which the spindle passes are not so liable to become worn as in pickers of the ordinary construction.

A.D. 1874, January 9.—No. 130.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Jean François Renard, fils, of Liège, Belgium, machinist.*)—" An improved " steam generator, applicable to stationary engines."

This invention relates to a multitubular steam generator with exterior fire-place, applicable to fixed engines.

The generator is composed of two cylinders of equal diameter, but of unequal length, united by a tube or cylinder of half their diameter, and by tube plates receiving a considerable number of steam tubes, which are exposed to the direct action of the fire; the flame and the gasses after passing through the sheaf of tubes going into two flues. Behind the fire-bridge is a reservoir receiving all the particles of coal carried away by the gasses. The feed takes place from the bottom end, which also serves as reservoir for the calcareous deposits accumulating within the generator.

The advantages claimed are great production and rapid getting up of steam, great saving of fuel by the complete utilization of the caloric, lightness and relatively smaller bulk, good steam and water chamber, construction simple, and easy inspection, repair, cleansing, and freeing from incrustation.

A.D. 1874, January 9.—No. 131.

NAPIER, James Murdoch, of York Road, Lambeth, in the county of Surrey.—" Improvements in bottle " labels."

According to this Provisional Specification, to prevent the fraudulent use of bottle labels a cancelling instrument is employed, which may consist of a tape attached under (or it may be attached to the face of) the label. When the cancelling instrument is pulled, the label is torn and defaced. Other modes of applying the cancelling label are also described.

A.D. 1874, January 9.—No. 132.

NORRIS, Richard Stuart, of Kenyon, near Manchester, in the county of Lancaster.—" Improvements " in machinery or apparatus for cutting or getting coal and other substances in mines or quarries."

According to this invention the machine is made with rotating compound cutters, so constructed, arranged, and combined, geared or connected together in rows, sets, or series, as at a single operation to cut or form in the coal or other substance to be operated upon, a groove, oblong recess, or continuous slot as long as the row of cutters measuring in a line cutting the axes of the whole of the cutters at right angles to such axes.

The machine is actuated by a handle or hand wheel carried by a quadrant adjustable to any angle, so as to facilitate working near the sides of a gallery.

The substance displaced by the cutters is withdrawn by screws, spirals, or equivalent means.

A.D. 1874, January 10.—No. 133.

DRECHSLER, Francis Joseph, of Camden Town, in the county of Middlesex.—" Certain improvements " in separators or winnowing machines."

The novelty of the invention consists first in constructing the bottom of the hopper with two leaves, one of which adjusts the extent of opening through which the seed passes on to the screen and the other receives a vibratory motion which assists the flow of the seed through the hopper.

Secondly, the invention consists in giving the meshes of the screen themselves in lieu of their frames a knocking or vibratory motion, and

Thirdly, in placing an indicator outside the machine in a position that will enable the finger of the same to be acted on by a fan that is driven by the blower and which forms a medium for indicating the requisite speed at which the blower should be driven when dressing different qualities and classes of seed.

A.D. 1874, January 10.—No. 134.

WALKER, George, of Birmingham, in the county of Warwick, manufacturer,—" Improvements in cur-" tain hooks and clips for suspending or securing hangings, garments, hats, and various other articles."

This invention refers to the formation of a hook or clip consisting of a pair of spring jaws or grippers capable of being opened or tightened by means of a sliding slotted plate, the bent end of the hook or clip having an eye for attachment to a swivel, hook, or other means of connection, and which may in some cases be dispensed with.

A.D. 1874, January 10.—No. 135.

DERRY, John Dickson, of Ladbrooke Road, Notting Hill, in the county of Middlesex.—" Improvements " in holders for lamps and candles."

Holders made so as to rock or swing, being in two parts, called respectively "carrier" (for lamp or candle) proper and "supporter" upon which the carrier rests or swings.

A.D. 1874, January 10.—No. 136.

RADFORD, John, of the Central Brass Works, Thornton Road, Bradford, in the county of York, brass founder.—" Improvements in safety valves."

This invention relates to employing an auxiliary valve and disk to which is fitted a weight for the purpose of keeping the required pressure in the boiler or steam generator.

The steam passing from the boiler or steam generator passes through a steam passage formed under a main valve seat, then through a passage made on the side of a cylindrical box forming the outside of the safety valve, and through an auxiliary valve, arriving in a chamber formed between the disk and the top of the main valve, pressing on the top of the main valve, keeping it shut.

Should the pressure in the boiler exceed the working pressure it will lift up a weight fitted on a spindle by means of the auxiliary valve closing, and the main valve will open, allowing the steam to escape through an escape pipe; directly the pressure falls to the working pressure the weight will fall, open the auxiliary valve, and close the main valve.

A tap or valve is fitted in the bottom part of the safety valve to which is fixed a spiral rod having a float at the extremity.

The tap or valve communicates through a passage with the valve box lid, in which a steam whistle is attached to give an alarm when the water is below water line, or a fusible plug is fitted in the stopper of the whistle.

A tap is also fitted to the safety valve to blow off steam when under pressure or when required to do so.

A,D. 1874, January 10.—No. 137.

BILLINGS, Michael, and BILLINGS, George Kinton, both of High Cross Street, Leicester, in the county of Leicester, engineers.—" Improvements in steam generators."

The invention relates to the application of plates in the rear end of the flue from the fire in the boiler to prevent the too free escape of the heated gases and products of combustion before they have given off their full amount of heat to the water, and to regulate such escape. These plates are applied so as to admit of a certain amount of passage past them, and in addition they are formed in two or more parts, applied in relation to each other, so as to vary the extent of the passage as required.

A.D. 1874, January 10.—No. 138.

JENSEN, Peter, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from Egmond Julius Erichsen, merchant and manufacturer, and Samuel Edwards, chief engineer to the Danish-English Gas*

Company, both of Copenhagen, Denmark.)—" New or improved modes of, and means and materials for the " manufacture of vats, gasholders, and other vessels."

Vats or other vessels made of artificial stone in one piece, or in several pieces dovetailed and cemented together.

A.D. 1874, January 10.—No. 139.

BRENNAN, John, of Sheffield, in the county of York, manager.—" Improvements in apparatus adapted " for facilitating the teaching of arithmetic in schools."

A frame or set of shelves provided with vertical partitions forming separate spaces for units, tens, and hundreds.

To these shelves are fitted indicators, by which figures can be displayed to view.

To each of the said shelves and spaces is also fitted a double-jointed rod, on which discs or counters can be slidden or arranged as required, in order to shew a correspondence between the numbers of discs or counters and the indicated figures.

A.D. 1874, January 10.—No. 140.

WRIGHT, Edmund, of Evesham, in the county of Worcester.—" Improvements in operating sewing and " other treadle machines."

The object of the invention is to produce rotary motion of the fly or band wheel of a sewing or other treadle machine by the reciprocating motion of the treadles through the medium of a double clutch or appurtenances.

A.D. 1874, January 10.—No. 141.

CORPE, Charles William, of Great Winchester Street Buildings, in the city of London.—" Improve-" ments in apparatus employed in the construction of concrete buildings."

This invention has for its object improvements in apparatus of the character described in the Provisional Specification of an invention for which Letters Patent were applied for by the said Charles William Corpe, dated 26th October 1872, No. 3183, such apparatus being used in the erection of concrete buildings, and according to these improvements apparatus of this description is much reduced in cost, and by its simplicity in working a great saving in labour is effected.

According to these improvements the horizontal panels are attached to the uprights by means of a hook and eye. The hook is secured to the rail by screw bolts, which can be easily removed. The eye is forged on, and a screw bolt is passed through the thickness of upright, then secured with a nut at the back, and with a washer on the front face of upright.

Another method of fixing the panels to uprights is by means of a slotted plate secured to rails of panel with screw bolts, and a conical headed pin on plate screwed on face of upright, the slot in the plate being passed over the head of the pin and then allowed to drop, thus securing the panel firmly to the upright.

Round cores for panels and uprights are used with slot holes at certain distances to form various thicknesses of wall, the parts being secured together by flat pins or wedges.

A.D. 1874, January 10.—No. 142.

COHRS, Johann Heinrich, of Steinstrasse, in the city of Hamburg, merchant.—" Improvements in " railway couplings."

This consists in threading a portion of the draw bar which is beneath the vehicle, and working an elongated nut, or a nut with elongated bars thereon, the nut with or without the bars being in connection with an extension piece through a long toothed pinion and a socket forming the attachment to the resistance spring.

The long toothed pinion is geared into by a wheel upon a rod, whose opposite end has a bevilled wheel upon it, and this is geared into by another bevilled wheel upon a rod running athwart the carriage, and to which handles are arranged for operating the coupling mechanism.

A.D. 1874, January 10.—No. 143.

FOSTER, Jonas, overlooker, and **WHITAKER, Welbury**, twister, both of Bradford, in the county of York.—"Improved machinery or apparatus for cleaning and smoothing the "dents" of reeds of looms "for weaving."

This consists of an arrangement for rotating brushes to act upon the dents of reeds so as to cleanse said dents.

A.D. 1874, January 10.—No. 144.

AVERY, Cyrus, of Islington, in the county of Middlesex, engineer.—"Improvements in teeth gearing and "in lubricating bearings applicable to horse power engines and other purposes."

The Specification of this invention describes a novel arrangement and combination of teeth gearing comprised within a hollow cylindrical main wheel with two sets of teeth formed on its inner circumference, the gearing being so arranged that motion is imparted to two central vertical spindles one turning within the other, and both in the same direction. Also lubricating bearings and axles by means of wicks.

A.D. 1874, January 10.—No. 145.

SYKES, John, of Barrow-in-Furness, in the county of Lancaster, furnaceman, **BATEMAN, Thomas Salmon**, of the same place, and **MELLARD, Joseph**, of Sheffield, in the county of York, hammerman. —"Improvements in machinery for rolling metals."

This invention consists in rolling metals by means of two rollers fixed on axles set at an angle, and of a table on which the article to be rolled is supported. As the rollers revolve they draw the article forward, and by reversing the motion of the rollers they force it back again. The requisite variations in the diameter of the article are produced by moving the rollers nearer to or further from each other.

A.D. 1874, January 10.—No. 146.

LORD, Edward, of Todmorden, in the county of York, machine maker.—"Improvements in sizing "machines, and in apparatus for drying yarn in the processes of sizing, dressing, bleaching, and dyeing."

My improvements in sizing machines consist in feeding the said machines by bobbins of yarn, which are brought direct from the spinning or winding machines. My invention consists also in drying the yarn after it has been sized, dressed, bleached, or dyed, by means of currents of heated or dry air, which are produced by the exhaustion of a fan or other apparatus for exhausting air.

A.D. 1874, January 10.—No. 147.

DEISS, Albert Augustus, of 46, Fish Street Hill, in the city of London, machine maker.—"Improvements in the extraction of quinine from bark."

This Provisional Specification describes extracting quinine from bark by a hot process. The bark to be treated is placed in a close vessel, and the vapour of alcohol or other solvent is admitted at the top and permeates amongst the bark and condenses to form an extract, which runs out at the bottom, from which extract the quinine is obtained.

A.D. 1874, January 10.—No. 148.

TALCOTT, Caleb McKinney, of Hartford, Connecticut, United States of America, now of No. 8, Southampton Buildings, London, merchant.—(*A communication from William Henry Post, of Hartford, Connecticut, United States of America, merchant.*)—"Improvements in machinery for the manufacture of screws."

My invention relates to improvements in machinery for manufacturing screws to be used in metal work. The first part of the said invention relates to the combination and arrangement of the parts of a screw machine in such a manner that a chuck for holding the stock from which the screw is made shall have a uniformly continuous motion and at the proper times a greater speed than that of the said chuck. Also to the construction of feed-mechanism. According to the second part of my invention, I modify my improved machine as follows: I construct the same with a revolving head having a rotary step-by step motion; from this head project two measuring-stops which leave enough of the rod projecting from the chuck to form a screw. The said revolving head is hung upon a reciprocating plate which moves in ways on a standard. A box-tool or stationary milling-tool is provided for cutting the rod to the proper diameter, and die holders fitted with screw-cutting dies are fitted on the ends of shafts which revolve in the said head; a cutting-off tool set in a tool-stock and operated by a lever is brought forward to cut off the screw. The screw is removed from the die-holder by the aid of a screw driver-blade.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 4 to July 10, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, January 12.—No. 152.

MOHR, Charles, of Birmingham, in the county of Warwick, manufacturer.—"A new or improved " method of rivetting the joints and seams of deeds and other boxes, travelling trunks, coal vases, and " similar articles."

The novelty in this case consists in the use or application of a spring clip to grasp and hold rivets in their places, before being headed or clenched, and at the same time to retain the plates or sheets in place where they are intended to be joined or rivetted together, so as to facilitate the operation of rivetting and reduce the cost thereof by saving time, and in the employment of unskilled labour.

A.D. 1874, January 12.—No. 154.

COCKINGS, James Septimus, of Birmingham, in the county of Warwick, patent agent.—(*A communication from Samuel Reynolds, of Pittsburg, state of Pennsylvania, United States of America.*)—" Certain im-" provements in snap or portable connectors for harness and other useful purposes where a metallic portable " connector may be required."

The novelty of the invention consists in so moulding the hook for casting that it should leave the sand without the necessity of coring, and thereby dispensing with much labor, in moulding, filing, and shaping, &c.

A.D. 1874, January 12.—No. 161.

ALLEYNE, John Gay Newton, Baronet, of Butterley Iron Works, Alfreton, in the county of Derby.— " Improvements in apparatus for puddling iron."

This invention relates to puddling furnaces of the kind having a rotating bottom of basin form, and to rabbles to be used in connection therewith.

The basin is formed with a double bottom and supported on a tubular shaft. A pipe extends up this shaft conveying water to jets in the space between the two bottoms, which jets play on the under surface of the upper bottom to keep it cool, the water flowing down the tubular shaft to an outlet at the bottom.

The rabble consists of a stem with a number of tines projecting down from it into the fused metal in the basin. The rabble has either a reciprocating or rotary motion imparted to it for more effectually stirring the fused metal.

A.D. 1874, January 12.—No. 163.

DEACON, Henry, of Appleton House, Widnes, in the county of Lancaster.—" Improvements in the " treatment of impregnated porous substances employed for effecting chemical decomposition of certain " gases at an elevated temperature."

This invention consists in renewing the activity of the contents of apparatus containing porous materials impregnated with chemical substances when such substances are soluble in water or will combine with water, or can contain water, as water of crystallization by cooling the contents of the apparatus, and then passing steam through such apparatus.

A.D. 1874, January 13.—No. 173.

BLACK, William, of Hedworth, near South Shields, and HILL, David, of East Jarrow, South Shields, both in the county of Durham.—" Improvements in the manufacture of soda in revolving furnaces."

The essential feature of this invention consists in heating the mixture of sulphate of soda, carbonate of lime, and small coal in such a manner as to prevent the formation, as far as possible, of caustic lime; and this may be accomplished by putting the whole mixture of sulphate of soda, carbonate of lime, and small coal into a revolving furnace together, or by heating the carbonate of lime by itself, but stopping short in the heating at that point at which it begins to give off carbonic acid and forms lime, and then adding the sulphate of soda and small coal.

A.D. 1874, January 13.—No. 175.

BEVERLEY, William, of the city and county of Aberdeen, North Britain.—"Improvements in life "buoys."

The feature of novelty which constitutes this invention is the elastic ring for fixing the buoy to a person's body.

A.D. 1874, January 14.—No. 182.

IMHOF, Daniel, of No. 547, Oxford Street, in the county of Middlesex.—"Improvements in automatic "musical instruments."

This invention relates to means of damping or sustaining notes produced by the strokes of hammers worked automatically by pegs or projections on a revolving barrel or other travelling surface.

The sounding object struck by each hammer is provided with a damper connected to a lever mounted by the side of the hammer lever, and having like it a nose or key point in the line of the travelling pegs. A projection on the hammer lever raises the damper when the hammer is raised to strike, and after the hammer has struck, the peg which acted on it, still for a short time holds up the damper by acting on the nose of its lever. For a sustained note, besides the ordinary peg for raising the hammer, an extended projection is fixed behind the peg on the travelling surface, which projection by lifting and keeping up the hammer raises the damper and keeps it up during the time desired for sustaining the note.

A.D. 1874, January 14.—No. 189.

HEATON, Charles, of New York city, United States of America, now residing at 22, Craven St., Strand, London.—"A new and improved emery or other grinding machines, parts of which are also applicable "to other machinery."

First. A device, or improvement, which enables the user of the machine to properly hang or attach the wheel or grinder to be revolved, and also, when required, to so change the location of its centre, that though it may be out of truth, it shall balance and revolve truly in the machine.

Second. A device for preventing emery dust or grit from cutting the arbor or its bearings, and also for conveying away from the arbor outside its bearings, such oil as may be of no further use.

Third. A convenient, new, and simple arrangement for bringing the rests used upon or about grinding machines to the position desired.

Fourth. A system of construction for a grinding machine, which enables great solidity to be joined to convenience in handling and use, and good mechanical construction.

A.D. 1874, January 16.—No. 214.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Emile Aime Alexandre Lamarre, of Paris, in the Republic of France.*)—"Improvements in "combustible compositions, and in their mode of application for signalling and illuminating purposes."

This invention relates to certain combustible compositions suitable for burning as signals or for illuminating purposes, whereby a brilliancy, duration, and intensity is imparted to what are known as "Bengal" lights, torches for signalling or illuminating purposes and pyrotechnic displays not hitherto attainable. Also to certain peculiar envelopes or cases for the said compositions when used as torches. Whatever may be the color of the flame decided upon, the basis of the composition, according to this invention, consists of boiled linseed oil and a suitable proportion of non drying oil, such, for example, as olive oil or colza oil combined with a chlorate and coloring matter.

A.D. 1874, January 22.—No. 272.

WORSSAM, Charles, of Commercial Wharf, Kingsland Road, in the county of Middlesex, engineer.—"A new and improved motive power machine."

The novelty of the invention consists in placing endless gearing traversing straps provided with hollow

The claims to this Complete Specification are—

1st. An apparatus for the purpose of lighting and extinguishing gas, in which compressed and rarefied air is used for opening and closing the cocks, and a galvanic current of electricity used for the lighting of the gas.

2nd. In an apparatus for lighting lamps by electricity, a mechanism for making and breaking the current of electricity in the jet, thereby lighting the gas, as and for the purpose set forth and described.

3rd. In combination with an apparatus in which compressed and rarefied air is used for the turning of the gas cocks of an electric apparatus so arranged that it will automatically transmit the current of electricity to the next lamp in succession, for the purpose set forth.

4th. In combination with the diaphragm *g* and rod *f* of the rocking lever *v*, spring wire X X, the metalic snapping wire O and the metalic pole *n*, as and for the purpose herein shewn and described.

5th. In combination with the electro-magnets *o*, *p*, and the armature 5 of the catch or recess 2, lever *v*, insulated wedge 7, springs *r*, *t*, and their insulated posts *q*, *s*, and the wires k, k^1, k^2, k^3, k^4, l, l^1, as and for the purpose herein set forth and described.

A.D. 1874, July 7.—No. 2388.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—(*A communication from Eugène Louis Jules, Ebaudy de Fresne, of* 10, *Boulevard de la Madeleine, Paris, in the Republic of France.*)—" Improvements in the propulsion of ships and vessels."

This invention has for its object improvements in the propulsion of ships and vessels.

The invention may in general terms be said to consist in replacing all mechanical agents such as paddle wheels, screws, &c., however actuated by the action of a column of air incessantly discharged against the liquid under the water line by means of one or several force pumps worked by steam power or otherwise.

A.D. 1874, July 7.—No. 2390.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from The Universal Signal Light Company, of the city, county, and state of New York, United States of America.*)—" Improvements in signal-lanterns."

This invention consists in securing to the bottom of a common lantern, a reservoir for some volatile oil in which is placed a small pump, having a hollow piston, the end of which is closed by the thumb in drawing the gas into the pump barrel. After the barrel has been filled by blowing through the piston the gas is driven upward through two tubes placed one on each side of the lamp-burner, where it instantly flashes into a flame a foot or more in height and gives a signal which may be seen at a long distance.

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- Electrical machine for, Bousfield (*Smith*), 380 (*App.* 31.)
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- Engine for, Manson, 1603 (*App.* 45.)

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Carpeting (substitutes for):
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- Constructing, regulating and adjusting, Reynolds, 101.

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- In making ice, West, 451 (*App.* 49.)
- Noxious vapours in rendering tallow, &c., Miller (*Brown*), 98.
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- Millstones, Haseltine (*Larer & Griscom*), 1129 (*App.* 40.)
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- Clasps for heddles, Haseltine (*Crowell*), 2291 (*App.* 1.)
- Feeding wire in making staples, Morgan-Brown (*Keniston*), 5.
- Pipes and bars, Clark (*Allin*), 350 (*App.* 31.)
- Screw blanks, Nugent & Fanning, 191 (*App.* 29.)
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- Corrugating metallic, Lafferty & Lafferty, 754 (*App.* 36.)
- For ore-crushers, Krom, 1058 (*App.* 39.)
- For washing wool, Holden & Holden, 114.
- Forging, rolling and casting, Allen, 614 (*App.* 34.)
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Cylinders and rollers (printing) :
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- Combined high and low pressure, Haseltine (*Jones & Pauly*),
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- Cylinder-heads, Hooker, 203 (*App.* 29.)
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Disintegrators :
- Making peat fuel, Dudgeon, 22.

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- Pontoon for floating, Clark & Standfield, 111.

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Drying fabrics :
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- Centrifugal machine for, Lafferty & Lafferty, 755 (*App.* 36.)
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Fibres (obtaining):
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Fibres (oiling):
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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 11 to January 17, 1874.

A.D. 1874, January 12.—No. 149.

KESSEL, Gustav, and SEYDELER, Gustav, of Berlin, Prussia, manufacturers.—"Improvements in apparatus for measuring the distances run over by wheeled vehicles."

This invention relates to apparatus for measuring and registering the distance passed over by wheeled vehicles.

A projection on one of the revolving wheels or axles of the vehicle at every revolution compresses an elastic bellows or ball containing air and connected by a pipe with a corresponding bellows or ball. At each compression of the first bellows the second is distended, and by a pawl and ratchet works a counter, which indicates the number of revolutions of the wheel. The counter is also geared by a coupling which can be disengaged at pleasure to a volute spring which it winds up, and at the same time works by means of a screw and nut a pencil along a paper cylinder, so as to trace thereon a line representing the length of journey. When the gearing of the volute spring is disengaged from that of the counter, the spring unwinding restores the pencil to its starting point, causing the paper cylinder to be turned a little round so as to present a fresh portion of its surface to receive the trace of the pencil.

A.D. 1874, January 12.—No. 150.

McMILLAN, David, of Huddersfield, in the county of York, machinist.—"Apparatus or appliances for cleaning the driving surfaces of machinery belts."

This consists of a revolving brush or scraper to act on the driving face of a machinery belt and remove therefrom any adhering greasy, fibrous, or dusty matter. Ordinarily the brush is not left in contact with the driving face of the belt; it is so arranged, however, that it can be moved at will.

Accidents cannot result, and the driving power is kept at highest efficiency.

A.D. 1874, January 12.—No. 151.

CROSLAND, James Stead, of the city of Manchester, in the county of Lancaster, engineer.—"Improvements in arrangements or apparatus for economising fuel and consuming smoke in stationary, marine, or locomotive, steam boiler and other furnaces."

The invention relates to the heating of the air supplied to furnaces or fires by the waste heat of the flues of such furnaces, and consists in employing a series or cluster of tubes or pipes placed in the flues of such furnaces through which the air is drawn by the draught of the fire or furnace, or through which it is forced by a fan, the air so heated coming upon the fuel above the fire bars as a hot current or blast. The air heated as above explained may enter flues as described in the Provisional Specification of my application for a Patent. No. 4239, dated December 24th, A.D. 1873.

In using the above mode of heating air the ash pit is closed to prevent the admission of cold air, but a part of the heated air is or may be passed between the fire bars, when hollow water fire bars are used. The invention also consist in employing a fan to draw the unabsorbed heated gases and air back from the extremity of the main flues to the furnace again, thus wholly or partly dispensing with a chimney except for noxious gases.

A.D. 1874, January 12.—No. 152.

MOHR, Charles, of Birmingham, in the county of Warwick, manufacturer.—"A new or improved method of rivetting the joints and seams of deed and other boxes, travelling trunks, coal vases, and similar articles."

The novelty in this case consists in the use or application of a spring clip to grasp and hold rivets in their places, before being headed or clenched, and at the same time to retain the plates or sheets in place where they are intended to be joined or rivetted together, so as to facilitate the operation of rivetting and reduce the cost thereof by saving time, and in the employment of unskilled labour.

A.D. 1874, January 12.—No. 153.

FOULIS, William, of Glasgow, in the county of Lanark, North Britain, civil engineer.—"New or improved machinery or apparatus for charging retorts."

The features of novelty which constitute this invention are—

First. The actuating of the scoop by means of one or more pulleys or drums round which the chains are wound and unwound in reverse directions.

Second. The arrangement of mechanism by which the scoop is inverted so as to deposit the charge in the retort.

A.D. 1874, January 12.—No. 154.

COCKINGS, James Septimus, of Birmingham, in the county of Warwick, patent agent.—(*A communication from Samuel Reynolds, of Pittsburg, state of Pennsylvania, United States of America.*)—"Certain improvements in snap or portable connectors for harness and other useful purposes where a metallic portable connector may be required."

The novelty of the invention consists in so moulding the hook for casting that it should leave the sand without the necessity of coring, and thereby dispensing with much labor, in moulding, filing, and shaping, &c.

A.D. 1874, January 12.—No. 155.

SHAW, Joshua, and SHAW, John, junior, of Wellington Street Works, Salford, in the county of Lancaster, hydraulic engineers.—"Improvements in hydraulic hoisting apparatus."

The inventors employ a cushion of air or a ram acted upon by a spring to absorb the pulsation of the water proceeding from the pumps to the cylinders of hydraulic hoists.

A.D. 1874, January 12.—No. 156.

MEWBURN, John Clayton, of 169, Fleet Street, in the city of London, patent agent and consulting engineer.—(*A communication from Girerd Chalumet, of Paris, France.*)—"A new textile fabric."

This Provisional Specification describes the manufacture of a fabric in which both the warp and weft are composed of the silk waste, called in France "bourrette," and which is the coarse silk round the cocoon, or the outside layer of the cocoon.

A.D. 1874, January 12.—No. 157.

HUGHES, Edward Thomas, of the firm of Hughes and Son, 123, Chancery Lane, London.—(*A communication from Nicolas Libotte, of Gilly, Belgium, mechanical engineer.*)—"An improved system and arrangements of safety apparatus, applicable to cages used in the shafts of mines and hoists."

This improved safety apparatus is distinguished from all others by its simplicity and facility of construction, for it is not operated as hitherto by springs which are susceptible of being relaxed or not acting, but by the motion and weight of the cage, that is by all its acting force, there being below the top frame of the cage a double movable frame having claws, which claw into the guides of the shaft of the mine or pin, the pressure being given by the weight of the parts, and also with additional weights and springs.

A.D. 1874, January 12.—No. 158.

WARD, Thomas, of 11, Prospect Terrace, Leeds, in the county of York.—"Improvements in railway brakes."

By means of a pulley fixed on one of the axles and connected by chain or band with another pulley under the carriage or truck, which second pulley on being put in gear by a clutch worked by the guard or driver winds a chain round the spindle, and thus applies the block to the wheels.

There is also a special coupling for connecting from carriage to carriage.

A.D. 1874, January 12.—No. 159.

RUSSELL, William, of Kilmarnock, in the county of Ayr, North Britain, hosier.—"Improvements in "and apparatus for the manufacture of Ayrshire bonnets."

The features of novelty in this invention consist in making such bonnets by what is commonly known as the common hosiery stitch, and also the polka stitch, which is performed by the use and application to the purpose of the common hosiery frame or the rotary frame in combination with the top carrier, the hand swing or bottom carrier, the hand narrower, and with or without the "tug" or "dandie" presser, and actuated either by hand or power as described.

A.D. 1874, January 12.—No. 160.

SCHMERSAHL, Augustus Edward, of Manchester, in the county of Lancaster, manufacturing chemist. —"Improvements in treating sewage water and other foul liquids."

The features of novelty in this invention consist in precipitating all the useful matters in solution or suspension in such liquids by means of a mixture of acids, say two parts of sulphuric acid mixed with water, and one part of hydro-chloric acid, which is added thereto in sufficient quantity to decompose such matters, when milk lime is added to neutralize the liquid, and the precipitate immediately falls, leaving the effluent water pure and odourless.

A.D. 1874, January 12.—No. 161.

ALLEYNE, John Gay Newton, Baronet, of Butterley Iron Works, Alfreton, in the county of Derby.— "Improvements in apparatus for puddling iron."

This invention relates to puddling furnaces of the kind having a rotating bottom of basin form, and to rabbles to be used in connection therewith.

The basin is formed with a double bottom and supported on a tubular shaft. A pipe extends up this shaft conveying water to jets in the space between the two bottoms, which jets play on the under surface of the upper bottom to keep it cool, the water flowing down the tubular shaft to an outlet at the bottom.

The rabble consists of a stem with a number of tines projecting down from it into the fused metal in the basin. The rabble has either a reciprocating or rotary motion imparted to it for more effectually stirring the fused metal.

A.D. 1874, January 12.—No. 162.

LOEWENSOHN, Joseph, of Berlin, in the Empire of Germany, manufacturer.—"Improvements in "safety-screws for every kind of packing."

This invention relates to safety screws for securing packing cases so that they cannot be opened for purposes of plunder without leaving distinct marks.

The safety screw has a tapering end helically twisted and a round shank surmounted by a head with a toothed lip. When driven into a hole bored in the wood it cannot be extracted by pincers or otherwise, but the shank must be cut by a chisel; and thus any attempt to open the case secured by such screws necessitates marks on the wood which lead to easy detection.

A.D. 1874, January 12.—No. 163.

DEACON, Henry, of Appleton House, Widnes, in the county of Lancaster.—"Improvements in the "treatment of impregnated porous substances employed for effecting chemical decomposition of certain "gases at an elevated temperature."

This invention consists in renewing the activity of the contents of apparatus containing porous materials impregnated with chemical substances when such substances are soluble in water or will combine with water, or can contain water, as water of crystallization by cooling the contents of the apparatus, and then passing steam through such apparatus.

A.D. 1874, January 13.—No. 164.

EYRE, George, of Codnor, in the county of Derby.—"Improvements in convertible school desks and "seats."

The improvements are designed to provide two backed seats facing in either direction, with each desk and bench.

The desk top is pivoted so as to form a seat when turned down.

A back is provided by a pivoted frame inclining either way, which also serves to lock the desk or seat.

The bench also has a similar swinging back, to face in either direction.

To provide room when the bench and desk are both used as seats, I make the bench to travel on racks on the floor gearing with pinions on the seat standards, or they may be otherwise fitted to move.

A.D. 1874, January 13.—No. 165.

NEWALL, Robert Stirling, and BOWMAN, Henry, of the Washington Chemical Works, Newcastle on Tyne.—" Improvements in the method of condensing muriatic acid gas and other fumes."

The gas is condensed by being admitted into small low chambers and having injected amongst it water divided into the finest spray, so as to bring the largest surface of water in contact with the gas and produce a rapid condensation.

A.D. 1874, January 13.—No. 166.

WILSON, Peter, of Noblehall, in the county of Peebles, North Britain, farmer and agricultural implement agent.—" A new or improved double-drill plough, parts of which are applicable to other agricultural " machines."

This invention consists in a new or improved construction of double drill plough, each drill plough, of an ordinary construction, being carried on a lateral shifting longitudinal beam, secured by keys or pinching screws and double screw nuts to strong arms projecting laterally on each side of a main central beam, which is arched up and continued forward to receive drawing shackle and hook, and carry the socket of the swivelling stem of the guiding carrying wheel or wheels in front of the ploughs, and which is swivelled by a long lever fixed on top of stem, and continued back so that the handle projects over a carrying rail on the back transverse bar carrying the shifting beams of the ploughs; and which project back with sockets for the vertical shifting and fixing stems of the rear carrying and trailing wheels, which thus run in the bottom of each drill formed by and just behing the ploughs; so that these, together with a new raising and lowering mechanism for the spindle or stem of the front steering wheel, regulate the working depth of the ploughs and drills to be formed. This raising and lowering mechanism consists in fixing the front free ends of a single or double length of chain to the upper and lower parts of the swivelling spindle of the front steering wheel, being brought back over the guide chain wheels and passed a half or whole turn in reverse directions round a large chain wheel, to which they are fixed; so that when this wheel is turned by a duplex ratchet wheel, with teeth and spring palls acting in opposite directions, both wheels being on the same boss and on a strong stud or centre bracket near the rear steadying lever—the raising and lowering of the spring pall lever, with an ordinary fixing notched segment, serves to set and fix the fore guiding wheels to any desired height to suit the working depth of the ploughs and drills desired, which regulating mechanism is also applicable for other forms of ploughs and other agricultural implements.

A.D. 1874, January 13.—No. 167.

HEARSON, Charles Edward, of No. 30, Millman Street, Bedford Row, in the county of Middlesex, ironmonger.—" Improvements in argand burners for burning coal gas or other illuminating gas and animal, " vegetable, and mineral oils."

This invention consists in dividing the inner tube of an argand burner into vertical air shafts or passages by means of vertical diaphragms or partitions, and fixing upon the said burner a dome or cap, having an aperture for the flame to pass through.

A.D. 1874, January 13.—No. 168.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from Frederic Adolphe Emile Redslob, of Robertsau, in Alsace Lorraine.*)—" Improvements in electric tell-tales for pressure gauges."

This invention relates to an electric tell-tale, whereby when the index of a pressure gauge attains a predetermined point an electric bell at a distance is caused to sound, by bringing into contact two springs in the electric circuit of a battery and the bell. The springs are mounted on an adjustable framing, so that they can be set for contact to be made when the index of the gauge reaches any desired point in its dial. The bell apparatus may be of any known construction, but is preferably made to consist of an electro-magnet composed of wires within a coil, bent back so as to present three branches, provided with an armature composed of a number of thin iron plates secured to a vibrating plate which works the bell hammer, and on which is a contact plate that can be shifted so as to present a fresh contact surface.

A.D. 1874, January 13.—No. 169.

NORMAN, John, of Hoxton Square, in the county of Middlesex.—"Improvements in means or apparatus "for clipping horses and other animals."

This invention relates to improvements upon an invention for which John Norman obtained Provisional Protection on January 13, 1873, No. 135.

For the purpose of keeping the upper plate down on the lever handle the axis of the lever handle is caused to pass through a hole in such upper plate, and a bar is employed over the upper plate through which screws are passed and through the other plates into the lower or fixed comb plate, and intermediate of such screws a third screw is employed which passes through the centre of the bar and bears upon the upper fixed plate. Or the bar may be formed with two return pieces, parts of which will form the guides for the moveable comb plate.

A.D. 1874, January 13.—No. 170.

TURNBULL, Samuel, of Leyton, in the county of Essex.—"An improvement in horseshoes."

The improved shoe is made with prongs near the heel or in other position into which small blocks of felt or equivalent material are firmly lodged so as to project from the surface of the shoe for giving an improved footing on slippery surfaces.

A.D. 1874, January 13.—No. 171.

DONISTHORPE, Alfred Russell, DONISTHORPE, George Edmund, WHITE, George, and **TOON, Joseph**, all of Leicester, in the county of Leicester.—"Improvements in the manufacture of "yarns from wool and such like fibrous substances."

This Provisional Specification describes machinery for drawing untwisted or soft slivers as they leave a condensing carding engine.

A.D. 1874, January 13.—No. 172.

ELLIS, James Edwin, of No. 63, Cremorne Street, and **REDGATE, Ezra**, of No. 9, Arboretum Terrace, both of Nottingham.—"Improvements in machinery for treating hides and skins."

This Provisional Specification describes the construction of machinery for fleshing, unhairing, scudding, and scouring hides and skins.

A.D. 1874, January 13.—No. 173.

BLACK, William, of Hedworth, near South Shields, and **HILL, David**, of East Jarrow, South Shields, both in the county of Durham.—"Improvements in the manufacture of soda in revolving furnaces."

The essential feature of this invention consists in heating the mixture of sulphate of soda, carbonate of lime, and small coal in such a manner as to prevent the formation, as far as possible, of caustic lime; and this may be accomplished by putting the whole mixture of sulphate of soda, carbonate of lime, and small coal into a revolving furnace together, or by heating the carbonate of lime by itself, but stopping short in the heating at that point at which it begins to give off carbonic acid and forms lime, and then adding the sulphate of soda and small coal.

A.D. 1874, January 13.—No. 174.

LAKE, John, of Manchester, in the county of Lancaster, engineer.—"Improvements in apparatus for "regulating the draught in the internal flues of steam generators."

This invention relates to certain peculiar apparatus for regulating the draught in the tubes or internal flues of steam generators and is partly based upon the invention for which I obtained Letters Patent bearing date the 7th of February 1865, No. 345.

The improvements consist in the addition of a rotatory notched regulating plate to the conical valve in order to vary the size of the openings between the corrugations; also in the use of two notched discs, one of which is adjustable over the other, in lieu of using a conical valve.

A.D. 1874, January 13.—No. 175.

BEVERLEY, William, of the city and county of Aberdeen, North Britain.—"Improvements in life-"buoys."

The feature of novelty which constitutes this invention is the elastic ring for fixing the buoy to a person's body.

A.D. 1874, January 13.—No. 176.

SCAIFE, John, of 20, Melbourne Street, North Street, Leeds, in the county of Yorkshire.—" A new or " improved material for use as packing for the piston rods of steam engines, pumps, and like uses; and " method for packing the same."

The feature of novelty which constitutes this invention is of woven or other fabric, or a combination of them, for packing, and in the method for packing the same.

A.D. 1874, January 13.—No. 177.

BULLOUGH, John, of Accrington, in the county of Lancaster, machinist.—" Improvements in machinery " or apparatus for sizing and drying yarn."

This invention relates to further improvements in machinery or apparatus for sizing and drying yarn, for which Letters Patent dated 12th December 1872, number 3770, were granted to me the said John Bullough, and this invention consists in improved arrangements of the drying cylinders and casings thereof, and for the more effectual supply of heated air to the yarn to dry same.

A.D. 1874, January 13.—No. 178.

HOWARD, James, of Bedford, in the county of Bedford, agricultural engineer, and **BOUSFIELD**, Edward Tenney, of the same place, engineer.—" Improvements in steam cultivating machinery."

This invention relates firstly to improvements in the means employed in the working of tilling implements by steam power, the object being to simplify their construction, and to effect a reduction in the cost of the apparatus. Secondly, to improvements in certain tilling implements, the object being to make them self-adjusting to suit the irregularities in the surface of the ground upon which they are intended to act and to facilitate their turning at the ends of the field.

A.D. 1874, January 13.—No. 179.

BIRD, Frederick Joseph, of Stroud, in the county of Gloucester, dyer.—" An improved manufacture of " mordant, applicable to the dyeing of cotton and union goods."

The mordant is composed of nut-galls reduced to powder, to which is added starch in powder, cream of tartar, carbonate of soda, and powdered alum.

A.D. 1874, January 14.—No. 180.

LEWIS, John William, of the town and county of Newcastle upon Tyne, sanitary engineer, and **WOOD**, George, of the same place, contractor.—" Improvements in stoves or ranges for heating, drying, cooking, " and baking."

We will firstly describe that part of our improvements relating to stoves for heating.

Surrounding the sides and back of the fire of any ordinary stove front we construct a warm air chamber or " main-box " by securing (at some inches apart and parallel and concentric with each other) two metal plates to the back of the stove front, between which plates and at suitable distances apart we place a series of metal baffling plates to increase the heating surface of the chamber and to prevent the too rapid egress of the air therefrom.

To the bottom of the " main box " we attach an " auxiliary box " which projects forward until its front face is in the same plane as the fire bars, and and we provide its interior with baffling plates.

Its bottom we pierce with an inlet hole and its top with an outlet hole immediately under another hole in the main box.

Part of the upper surface of the auxiliary box we place underneath the bottom grate, and make it with a slope towards the front hearth to allow the ashes to fall thereon and leave the air free access to the fire; we thus utilize the heat radiated downwards from the bottom grate in heating the air previously to its entrance into the main box.

On the top of the main box and covering the fire with its face closely jointed up to the back of the stove front we place a " super-heating-box " (agreeing in form with the main box) which we make either with one compartment for the circulation and heating of air only, or with a top and a bottom compartment, the latter for the entree and heating of the air, and the former for the collection of the smoke and products of combustion from the fire.

The upper plate of this box is capable of removal.

In the latter case we provide the interior of the main box with three smoke flues (one on each side of the fire and one at the back) for conveying the smoke into the smoke compartment of the superheating box, from the air compartment of which we convey the air in its warmed state by two or more tubes through the smoke compartment, and the upper ends of these tubes we arrange so that they can be joined on to other tubes.

But when we arrange the superheating box with only one compartment for heating air we provide but one smoke tube, which we carry through the superheating box.

When we construct the stoves more especially for ventilating purposes we arrange the auxiliary box as a "vitiated air box" to feed the fire with air which may be drawn from the apartment containing the stove.

At its ends or back we pierce a hole which we connect with a "vitiated air duct" which may lead from any part of the apartment.

The faces of the vitiated air box exposed to the ash pit we pierce with other holes for the escape of the vitiated air into the fire.

To give the warm air developed in the warm air chamber its hydrometric properties before its egress from the warm air ducts we provide in the mouths thereof a "hit and miss" valve and place therein a small vapour trough containing pure or medicated water, in passing over which the heated air absorbs the requisite quantity of moisture.

That part of our improvements in stoves or ranges for cooking, baking, heating, and drying, consists in placing at the back of the fire a self contained metal main chamber provided with one or more through smoke tubes in combination with baffling plates, and in combining therewith and connecting thereto two auxiliary metal boxes placed below the main box above on a level or below the bottom grate of the range, but in any case being acted upon directly by the fire. Cold air enters and traverses the auxiliary boxes into the main box and escapes heated therefrom into a pipe whereby it may be conveyed to any room desired.

If used in connection with a drying closet we combine with the warm air pipe a vitiated air pipe, which we place at a lower elevation and lead it from the closet into the ashpit of the range, where it is liberated and drawn through the fire and into the smoke flue.

If the range have a back hot water boiler we place the warm air chamber at the back of the same and in contact therewith.

On the side of the fire next the oven we place a small metal hot air chamber so that the fire has direct contact with one of its sides, and provide it with interior baffling plates and with a small cold air valve, and make at its opposite end an orifice in communication with the oven to admit the hot air developed in this chamber.

For providing large quantities of hot water without the employment of a boiler of equivalent capacity in direct contact with the fire we place at the back of the fire a small high pressure boiler and attach to it a flow and a return pipe, and these pipes we lead to a capacious hot water cistern in any convenient position in the same room or otherwise, placing it at a higher level than the boiler and supplying it at its lower part with cold water in the usual way. The water constantly circulating between the boiler and the cistern becomes eventually of a uniform high temperature.

If necessary, in addition to the hot water cistern, we lead branch pipes to a steaming or hot closet, whereby we are enabled to carry on simultaneously a variety of cooking operations from resources deriving heat from one fire.

When the warm air chamber is applied in connection with the furnace of a baking oven we prefer to make it curvilinear in form, making the concave side in conjunction with a brick arch form the roof of the oven.

A.D. 1874, January 14.—No. 181.

COLE, Frederic, of No. 24, Victoria Park Road, South Hackney, in the county of Middlesex.—"An im-"proved method of and machinery for crushing and reducing to impalpable powder, baryta, cocoa, refined "sugar, and similar substances, both vegetable and mineral."

The rollers used in this machine, being furnished with knives, scrapers, and combs, will prevent any clogging, a desideratum, especially for cocoa and sugar, not hitherto obtained.

A.D. 1874, January 14.—No. 182.

IMHOF, Daniel, of No. 547, Oxford Street, in the county of Middlesex.—"Improvements in automatic "musical instruments."

This invention relates to means of damping or sustaining notes produced by the strokes of hammers worked automatically by pegs or projections on a revolving barrel or other travelling surface.

The sounding object struck by each hammer is provided with a damper connected to a lever mounted by the side of the hammer lever, and having like it a nose or key point in the line of the travelling pegs. A projection on the hammer lever raises the damper when the hammer is raised to strike, and after the hammer has struck, the peg which acted on it, still for a short time holds up the damper by acting on the nose of its lever. For a sustained note, besides the ordinary peg for raising the hammer, an extended projection is fixed behind the peg on the travelling surface, which projection by lifting and keeping up the hammer raises the damper and keeps it up during the time desired for sustaining the note.

A.D. 1874, January 14.—No. 183.

BURGESS, William James, and **BURGESS**, Charles Thomas, both of Brentwood, in the county of Essex.—" Improvements in reaping and mowing machines."

This Provisional Specification relates—

1st. To the means of carrying the gear frame, so as to allow of adjustment in the height of the cutting apparatus.

2nd. To a means of throwing the driving wheel into and out of gear.

3rd. To arrangements by which the knife is made more readily removable.

4th. To an improvement in the construction of the fingers, and the guide surfaces thereon.

A.D. 1874, January 14.—No. 184.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex. —(*A communication from Jules Varinet et A. Enoult, fils, of Sedan, in the Republic of France, manufacturers.*)—" Improvements in dressing and finishing woollen cloths and other like fabrics, and in apparatus " therefor."

This invention relates to means of imparting to cloth and like fabrics a fine finish by subjecting them to the action of rollers having roughened or grinding surfaces, which are arranged in a machine with brushing and smoothing rollers, so that a web in passing continuously through the machine is subjected to the action of the rollers successively.

The roughened or grinding rollers are prepared either by facing them with millstone or other stone, or coating them with grinding powders glued on, or with paper or cloth served with such powders, or with caoutchouc or gutta-percha with which such substances are incorporated.

A.D. 1874, January 14.—No. 185.

POURCHÈ, Albert, of Montpellier (France).—" An improved method of and apparatus for the destruction " of insects by the aid of steam alone or mixed with chemical vapours, to be applied to agriculture."

This invention relates to an improved method or process for the destruction of insects, and which consists in the injection of water steam alone, or of water steam mixed with chemical vapours or gases.

A.D. 1874, January 14.—No. 186.

EASTWOOD, David, of Mill House, Midgley, in the parish of Halifax, in the county of York, worsted spinner.—" Improvements in looms for weaving.

This invention relates to healds for looms.

Healds constructed according to this invention are made of strips of metal, through one end of each strip is a stave hole or holes through which the healed staves are passed; the " eye " or hole through which the warp is passed is formed at any convenient distance from the end of the strip, by preference about midway its length, and in as much as the strips must be so placed on the staves as to present their edges in the direction of the warp beam; the strips are at each side of the eye slightly bent or twisted so as to afford a clear and direct passage way for the warp threads through the eyes of the strips constituting the heald.

A.D. 1874, January 14.—No. 187.

KIRK, William, of Snig Brook, Blackburn, in the county of Lancaster, shuttle maker.—" Improvements " in machinery or apparatus to be employed in the manufacture of " tips " for shuttles for weaving."

I employ " swages " formed according to the shape and size of tip required; one portion or part thereof is secured to a steam hammer arranged so as to be controlled by a lever worked by the foot of the operative, leaving both hands at liberty to work the bar or rod from which the tip is being forged.

A.D. 1874, January 14.—No. 188.

SMITH, John Henry, of Morley, in the county of York, overlooker, and **HARTLEY, Oliver Heywood**, of Ardsley, near Wakefield, in the county aforesaid.—" Improvements in self acting mules."

The object of this invention is that by the application of self-acting mechanism to increase, alter, or vary the speed of the movement of the carriage, and of the rotation of the spindles at any point of the outward traverse or advance of the carriage.

A.D. 1874, January 14.—No. 189.

HEATON, Charles, of New York city, United States of America, now residing at 22, Craven St., Strand, London.—" A new and improved emery or other grinding machines, parts of which are also applicable " to other machinery."

First. A device, or improvement, which enables the user of the machine to properly hang or attach the wheel or grinder to be revolved, and also, when required, to so change the location of its centre, that though it may be out of truth, it shall balance and revolve truly in the machine.

Second. A device for preventing emery dust or grit from cutting the arbor or its bearings, and also for conveying away from the arbor outside its bearings, such oil as may be of no further use.

Third. A convenient, new, and simple arrangement for bringing the rests used upon or about grinding machines to the position desired.

Fourth. A system of construction for a grinding machine, which enables great solidity to be joined to convenience in handling and use, and good mechanical construction.

A.D. 1874, January 14.—No. 190.

SIVAL, Félix, of Neuilly (France), mechanician.—" Improvements in the manufacture of lace."

This relates to the manufacture of Chantilly cloth or fabric by mechanical means, consisting principally in so arranging the bobbin carriages and the bars as to permit of the use of the " Leaver " machine.

A.D. 1874, January 14.—No. 191.

NUGENT, Edward, of Brooklyn, in the county of Kings, in the state of New York, and **FANNING, John**, of Brooklyn, aforesaid, in the United States of America.—" Improvements in machinery for the " manufacture of screws and screw nails."

The feature of novelty of this invention consists in constructing a machine for shaving, nicking, and screwing screw blanks for the manufacture of screws and screw nails, which can only be explained by reference to the drawing accompanying the Complete Specification.

A.D. 1874, January 15.—No. 192.

STEWART, Duncan, of the firm of Duncan Stewart and Company, engineers, of the city of Glasgow, in the county of Lanark, North Britain.—" New or improved constructions of clips or holders and their chains " for cloth-stretching and finishing machines."

This invention consists of an improved construction of the parts of chain clips for griping the selvages of cloth while being treated in stretching and finishing machines (such as the " Bridson " and others); being also improvements on the patented invention, John Erskine Brown, No. 3415, dated 29th December 1866, and consists in forming the chain in a parallel form, each link of a light deep hollow rectangular form, to receive the teeth of their chain wheels, and having an open or double and a single central joint piece at their opposite ends, so that the front end of each fits into the back end of the next link, with a pin passed through them and riveted on each side to form the articulate joint between the links throughout the chain. Each link carries the lower stationary jaw of the clip attached to its one side by two arms, to which the upper movable jaw is jointed by two arms projecting down from it and a long small joint pin, upon which an improved construction of twisting spiral spring is mounted, coiled out of a single piece of fine hard drawn steel wire, from a projecting looped lever piece in the centre towards each side in right and left handed spirals, leaving the two free ends projecting to prevent their twisting, while the looped lever piece is free to act, by the power of both spirals, on a central pendant arm of the upper acting jaw of the clip to make it gripe the selvage of the cloth, otherwise all much in a usual manner ; an arm projects upwards from the moving jaw, which works on a stationary cam or groove surface to pull it back against the power of the spring at the parts of the machine where the cloth has to be entered or released from these grips or gripers, while and by the motion of these and the chains through the machine.

A.D. 1874, January 15.—No. 193.

SMITH, Richard, 61, Cleethrope Road, Grimsby, **STEPHENSON, William**, 59, Cleethrope Road, Grimsby, and **VERE, John**, 67, Cleethrope Road, Grimsby.—"An improved treble purchase capstan for "fishing and other vessels."

The application of a treble purchase to existing capstans, thus increasing their power three-fold, which power can be applied instantaniously, thus enabling fishing and other vessels to recover their net or gear under all circumstances, which is not the case at present with existing capstans.

A.D. 1874, January 15.—No. 194.

JONES, Edward, of Birmingham, in the county of Warwick, mechanical engineer.—"Improvements in "metallic cartridge cases."

This invention refers to such metallic cartridge cases as have the separate head connected to the tubular body by expanding or rivetting the hollow neck of the head in the central opening in the base of the tubular body, and the said invention consists in preventing, on the explosion of the cartridge, the lateral expansion of the base of the body and the consequent loosening of the head, and the escape of gas at the junction of the head and body.

This object is effected by making the base of the body taper, that is, thicker at the central parts than at the marginal parts. By this means great resistance is offered to the lateral expansion of the base after the rivetting of the head thereto. Or the same object is attained by making the base of the body of uniform thickness throughout, and providing it around the central opening with an internal or external projecting ring, or with both an internal and external projecting ring.

A.D. 1874, January 15.—No. 195.

TEALE, William Edward, of Manchester, in the county of Lancaster, lamp manufacturer.—"Certain "improvements in lamps."

This invention relates to a mode of preventing the heating in the body of the lamp of the light hydro carbon or other inflammable oils used in certain classes of mineral oil lamps known as "sponge lamps, and consists of a peculiar arrangement of wicks and wick tubes for that purpose.

A.D. 1874, January 15.—No. 196.

MOISON, Théophile, engineer, of 13 Rue Gaillon, Paris.—"Improvements in machines for drying "tissues, felts, threads, and textile materials, and for destroying at the same time, if necessary, any vegetable "matter which may be contained in the fibrous animal material."

This invention consists in improvements in machines for drying tissues, felts, threads, and textile materials by hollow celled cylinders covered with wire gauze or perforated plate and currents of heated air admitted to the cells as required, the air being forced preferably by a pump. Also to an improved means of stretching the tissue before it reaches the drying cylinders:—To adjustments for making the cylinder suitable for varying widths of tissue and to applications of acid solution of sulphuric acid to destroy vegetable matter where it is mixed with animal fibrous matter during the drying process.

A.D. 1874, January 15.—No. 197.

YATES, Henry, of Rue Lafayette, Saint Pierre-les-Calais, in the Republic of France.—"Improvements in "the ornamentation of lace and other textile fabrics."

This invention relates to the addition of a "purl," which is made and at the same time applied by machinery, whilst such ornamentation is applied after and not during the manufacture of the said fabrics.

A.D. 1874, January 15.—No. 198.

TAYLOR, Thomas, of Little Bolton, in the county of Lancaster.—"Improvements in apparatus for "grinding or surfacing metal."

This invention is designed principally to be used in place of the planing machine for producing tru plane surfaces on metal, and consists chiefly of a headstock carrying a driving shaft (on one end o which is mounted a grindstone), and capable of adjustment on a short bed or slide, somewhat simila to a lathe.

On another longer bed or slide placed at right angles to the former is mounted a carriage provided with suitable brackets to support the work, which carriage is caused to move to and fro on the bed or slide, holding the work in contact with the face (not edge) of the revolving grindstone, and thus the work is ground to a true surface.

A.D. 1874, January 15.—No. 199.

VAN DYK, Herman, of West Smithfield, in the city of London, manufacturer.—"Improvements in "dressing and travelling bags, stationary, and other similar cases."

The bags and cases according to this invention have metal bands from which the handle plates spring. The insides of the bags are fitted with movable shelves or partitions, between which shirts or other articles can be strapped and held in place.

A.D. 1874, January 15.—No. 200.

ARCHBOLD, George, of Spittal, in the borough of the county of Berwick on Tweed, Doctor of Science, analytical and consulting chemist.—"Improvements in the treatment of substances containing alumina, so "as to render them more suitable for the production of aluminous compounds."

This invention relates to the treatment of substances containing alumina, such for example as china clay, so as to render the alumina contained therein more suitable for the production of aluminous compounds and products, and consists in subjecting the substances containing alumina such as china clay to a drying process, and when sufficiently dessicated reducing the same to a fine state of division by any well known methods. The firmly divided clay is then incorporated with spent hops, spent malt, unmalted grain, sawdust, charcoal, or any combustible porous substance, and the mixture is then impregnated or saturated with an hydrocarbon, such for example as heavy coal oil or other economical natural products or the results of the distillation of carbonaceous materials. The materials so mixed and incorporated are then subjected to the action of heat either in a reverberatory furnace or otherwise, when it will be found that the aluminous constituent of the clay thus prepared will be more easily attacked by sulphuric and other acids, and that a neutral sulphate of alumina can be obtained therefrom.

A.D. 1874, January 15.—No. 201.

WOOD, Charles, of the Tees Iron Works, Middlesbro' on Tees, in the county of York.—"Improvements "in granulating iron and in granulating machines."

The Provisional Specification relates to improvements in machines described in the Specification of the Patent 2618/72. The use of chemical substances to purify iron during granulation is also suggested.

A.D. 1874, January 15.—No. 202.

CLARK, Josiah Latimer, and STANDFIELD, John, both of 5, Westminster Chambers, Victoria Street, in the city of Westminster.—"Improvements in floating docks and pontoons."

This Specification describes constructing floating docks or pontoons of a series of circular tubes placed parallel to each other to form a structure of a U shape, or the horizontal platform may be square chambered, with vertical circular tubes at the sides or ends; valves are provided for admitting water, and pumps for pumping it out. When the pontoon is floating the tubes or chambers of the horizontal platform are filled with air. When the pontoon is to be submerged, water is pumped into the vertical tubes and is also admitted to the bottom of the horizontal tubes or chambers, the air contained in them then becomes compressed. When the pontoon is subsequently raised, the air expands again and expels the water. Pontoons without vertical sides may be used with such floating docks, so that when a vessel has been raised out of the water it may be towed away on the pontoon.

A.D. 1874, January 15.—No. 203.

HOOKER, William Davis, of San Francisco, California, in the United States of America.—"Improvements in direct acting steam engines, also including improvements in pumps, said engine being applicable "for driving pumps, steam hammers, and other machinery in which a direct action is required."

The first part of this invention relates to improvements in direct acting steam engines, by which the piston may be started from any point in the stroke, there being no dead point.

This invention consists first, in a novel construction and arrangement of ports in a supplemental piston in relation to ports leading to the end of said piston chamber, and also ports leading to an auxiliary valve, in such a manner that the live steam constantly contained in the said piston and supplied from the main valve chamber shall drive the main valve for the first part of its stroke, and be supplied behind the end of the piston at the last of its stroke to balance the valve, suitable provision being made to compress the live steam so supplied, so that it will be impossible for the piston to strike the end of its chamber. The office of the auxiliary valve is to exhaust the steam from the said piston chamber, and supply steam to finish up the stroke of the main valve.

The live steam which was compressed behind the end of the supplemental piston is always ready to drive it and the main valve, the instant the auxiliary exhausts the steam from the chamber at the opposite end of the piston.

This invention further consists in the use of recesses in the main cylinder-heads, within which the arms which are operated by the piston to move the auxiliary valve are protected from being broken by the piston. It also consists in constructing a valve-bar, which moves in suitable slots and engages with the auxiliary-valve, so that the valves shall always be in direct contact with the arm at starting, and so that the bar and valve can be removed with very little trouble.

This invention also consists in certain improvements in force pumps, whereby the valve seat may be packed and secured, the valve guided, and the vacuum chamber packed by the use of a threaded valve spindle which so secures the supply valve and seat that they can be easily removed, independently of the discharge valve; and any or all the valves can be removed independently of each other by simply taking off the cover of the chamber.

This invention further relates to the employment of a buffer and check nut, by which the lift of the valves may be regulated.

A.D. 1874, January 15.—No. 204.

CLARK, James, of Manchester, in the county of Lancaster, india rubber manufacturer.—" Improvements " in waterproof garments, and in the production of materials from which such garments are made."

This invention relates to making waterproof garments partly of porous material to allow of ventilation, and in making such garments from cloth " proofed " on a portion of its surface. Also in forming eyelet holes in waterproof garments.

A.D. 1874, January 15.—No. 205.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Thomas Robertson Sinclaire, of the city and state of New York, United States of America.*)—" Improvements in the mode of and apparatus for filtering, rectifying, or " clarifying liquids and gases."

This invention consists in supplying a liquid or gas into a filtering chamber contained in an air-tight vessel, and causing the same while under pressure to pursue a centripetal course and to enter a receiver located within the body of the filtering material contained in the filtering chamber.

A.D. 1874, January 16.—No. 206.

BALL, Charles Julius, of New Bridge Street, Blackfriars, in the city of London.—" Improvements in " the manufacture of drills for boring holes."

This invention consists of manufacturing the bars, of which drills used for drilling holes in rock or other hard substances are formed of a cross section similar in form to that of the cutting face of the drill (in end view), but of somewhat less diameter, by which method of manufacture great economy of time and labour in repairing and sharpening such drills is effected.

A.D. 1874, January 16.—No. 207.

HUERNE, Prosper, of San Francisco, California, in the United States of America.—" An improved self- " cleaning water filter and connections, whereby water may be filtered for household purposes and stored in " quantity so as to be used at pleasure."

This invention relates to an improved water filter to be attached to water faucets in buildings for the purpose of filtering the water which is used for drinking and other purposes.

Claim is made,

Firstly. To a reversible hollow globe or oblong shell provided with inlet and outlet tubes in combination with a corresponding filtering stone having a central hole or passage and short pipes and tubes.

Secondly. To the hollow globe or shell with its filtering stone in combination with pipes and a tank, said pipes being connected by another pipe provided with a cock by which the operation of the filter may be reversed for cleaning the filter with filtered water.

Thirdly. To a reversible globe or ovoid filter provided with a corresponding interior filtering stone, said globe or ovoid being reversible for the purpose of cleaning the stone.

A.D. 1874, January 16.—No. 208.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from John Rogers, of the city, county, and state of New York, United States of America.*)—"Improved apparatus for the manufacture of lamp black."

I so construct a lampblack furnace that a natural vertical air current will be created by the flame all round the pan, and supply only just as much air to the flame as will convert the products of combustion into lamp black. I make the pan of annular form with a central perforated pipe for the supply of air, and I also make the shell or furnace, enclosing the combustion chamber, with double walls perforated for admitting radial horizontal air currents to mingle with the upward currents.

A.D. 1874, January 16.—No. 209.

DE FEVER, Charles, of No. 10, Rue de la Fidélité, Paris, in the Republic of France, civil engineer.—"An improved machine for sowing and planting."

This machine consists of the principal parts of an ordinary drill; to the nave of one of the wheels is fixed a cog wheel, giving motion (by means of an intermediate pinion) to a second pinion fixed on a shaft carrying a number of disks. In the periphery of the disks are receivers or wells into which the seed passes from a hopper. The seed is retained in the receivers by a spring, and at the proper time releases the seed and allows it to drop into the ordinary furrow tubes.

A.D. 1874, January 16.—No. 210.

ATKINS, James, of the firm of Robert Walter Winfield and Company, of Birmingham, in the county of Warwick, merchants and manufacturers.—"Improvements in the manufacture of ornamental metallic tubing."

According to this invention a plain strip of sheet metal is taken and operated upon while in a flat or nearly flat state, by means of a pair of ornamental dies worked in a stamp, so as to impress upon the flat strip a series of detached or separated ornamental patterns, or a continuous or running pattern. After the strip has in this way been ornamented, the plain portions may be pierced, and the ornamented or ornamented and pierced strip is then bent up into a skelp or open jointed tube and its edges connected by brazing. The tubing is next drawn over a plug for the purpose of giving a cylindrical, hexagonal or other figure to the tubing, and is finished by burnishing or otherwise. By this invention a greater variety of ornamental designs or patterns, and in higher or bolder relief can be produced on the tubing than can be produced by the ordinary method of ornamenting by the use of impressing rolls.

A.D. 1874, January 16.—No. 211.

SMITH, Frederick Henry, Doctor of Medicine, of Lewisham, in the county of Kent.—"Improvements in the manufacture of tape plaisters, or bandages, and in mounting the same upon reels or holders."

This invention has for its object improvements in the manufacture of adhesive plaister for surgical purposes, whereby it is rendered soft and pliable so as to admit of its being cut (by suitable mechanism) into long strips or tapes of various widths, which can be wound upon reels or holders in accordance with this invention for convenience in use, and the plaister thus prepared and mounted will not be injured by keeping in any climate.

A.D. 1874, January 16.—No. 212.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Robert Arthur Griffin, of Montreal, Canada, gentleman.*)—" Improvements " in the manufacture of peat fuel, and in apparatus therefor."

This invention has reference to improvements in the manufacture of peat fuel, and in apparatus used therefor, whereby peat fuel is produced in less time and with less labor, and of better quality than by the processes [*at present in use**].

A.D. 1874, January 16.—No. 213.

BELIER, Charles, of 44, Aldermanbury, in the city of London.—(*A communication from Manien Roullier, of 228, Boulevard Voltaire, Paris, in the Republic of France.*)—" Improvements in mats."

This Provisional Specification describes making mats from waste pieces of leather.

A.D. 1874, January 16.—No. 214.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Emile Aime Alexandre Lamarre, of Paris, in the Republic of France.*)—" Improvements in " combustible compositions, and in their mode of application for signalling and illuminating purposes."

This invention relates to certain combustible compositions suitable for burning as signals or for illuminating purposes, whereby a brilliancy, duration, and intensity is imparted to what are known as "Bengal" lights, torches for signalling or illuminating purposes and pyrotechnic displays not hitherto attainable. Also to certain peculiar envelopes or cases for the said compositions when used as torches. Whatever may be the color of the flame decided upon, the basis of the composition, according to this invention, consists of boiled linseed oil and a suitable proportion of non drying oil, such, for example, as olive oil or colza oil combined with a chlorate and a coloring matter.

A.D. 1874, January 16.—No. 215.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Alexandre Ireland, of Paris, in the Republic of France.*)—" Improvements in machinery or " apparatus for making wooden rollers employed in spinning or for other purposes."

This invention relates to a peculiar construction and arrangement of machinery or apparatus for making the wooden rollers employed in spinning machines, or for other purposes to which such rollers may be applicable, whereby greater accuracy of work is obtained with increased rapidity of production than can be obtained by hand labor alone.

The said machine comprises generally a rotary planing tool and suitable holders mounted on a sliding carriage for holding firmly in their proper position the blocks or segments composing the roller or the covering or casing of a roller, as the case may be, whilst being shaped. The invention further comprises a box or holder for facilitating the uniting together of the various blocks or segments after they have been shaped in the shaping machine.

A.D. 1874, January 16.—No. 216.

HEYWOOD, John Sharp Cromartie, of Notting Hill, in the county of Middlesex.—" Improvemen " in compositions to be applied to the surfaces of ships and to other surfaces for the purpose of protecti " them, and in the treatment of such compositions when so applied."

The invention consists in preparing a composition of graphite or anthracite, or material of a like charact combined with solutions of asphaltum, pitch, tars, or bitumens of any description, in naptha or spirits of a kind capable of dissolving such substances.

The above composition is applied to the surface to be protected, after which it is polished by means brushes or other soft rubbers.

A.D. 1874, January 16.—No. 217.

LOWRY, George, of Salford, in the county of Lancaster, engineer.—" Improvements in governors " steam and other motive power engines."

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* The words "at present in use" are found in the copy of the Abridgment delivered by the Applicant, but do not appear the original Abridgment.

The machinery consists of two discs fixed on the crank or other shaft, and these discs support the axles of six weighted levers which are all connected together by links jointed to a centre plate loose on the crank or other shaft. Two of the axles of the weighted levers are connected by a regulating spring, and one of the axles is connected to the eccentric for the cut off or admission valve.

A.D. 1874, January 16.—No. 218.

SIVAL, Félix, of Neuilly (Seine), France, mechanician.—"Improvements in the manufacture of ornamental "fabrics made on lace machines."

This consists chiefly in holding the bobbin threads which pass across the fabric at their return points by means of supplementary or interlacing threads, and since these threads are only visible on the wrong side of the fabric, the effect is produced of an uninterrupted bobbin thread.

A.D. 1874, January 16.—No. 219.

GRIFFIN, James Theodore, of No. 77, Upper Thames Street, in the city of London.—(*A communication from Jonathan Austin, of Fulton Street, New York, in the United States of America.*)—"Improvements in the "construction of wrenches for turning pipes, bars, and other similar articles."

This consists in fitting a curved extension piece on the handle. To the extension piece a curved dog claw with a serrated face, the serrations of which, with other serrations on the face of the curved extension piece from the jaws or teeth for gripping the article to be turned, the bite taking place while the tool is moved in one direction only.

A.D. 1874, January 16.—No. 220.

BROWNE, Alexander, of the firm of Browne and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—(*A communication from the Foundries and Forges Company, of Terre Noire, La Voulte, and Bessèges, in the French Republic.*)—"A new process of converting cast iron, wrought "iron, scraps, old rails, and such like materials, into steel, or metal having the properties of steel."

The feature of novelty of this invention consists in a process of converting cast iron, wrought iron, scraps, old rails, and such like materials into steel, or in a metal having the properties of steel by means of phosphorus, silicium, borium, arsenic, manganese, ferro-manganese, or ferro-silicium combined therewith in small proportions.

A.D. 1874, January 17.—No. 221.

LE BACQ, François, of 17, Crown Street, Soho, in the parish of St. Giles, county of Middlesex, London. —"A new antislippery horse shoe."

Small grains (pegs) of steel are introduced in the horse shoe in small holes. The adaption of these steel grains can be made either to the hot or cold iron, and without perforating the horse-shoe all through, as can be seen in fig. 3 & 5. The grains of steel so introduced may have all kind of form, round, square, triangular, conic, &c., and are not screwed in the horse shoe, but worked in the iron. The position and the fastening of these grains of steel in their holes is a speciality, and will prevent so many accidents to the public and to horses, accidents so numerous on the asphaltes of our streets, stopping the traffic often for hours. Le Bacq's invention will be of great utility to the public.

A.D. 1874, January 17.—No. 222.

WHALLEY, James, of No. 11, Sussex Place, Manchester Road, Cubitt Town, Poplar, in the county of Middlesex, engineer.—"Improvements in machinery or apparatus for hulling or decorticating, winnowing, "cleaning, polishing, and assorting rice."

This invention has for its object improvements in machinery or apparatus for hulling or decorticating, winnowing, cleaning, polishing, and assorting rice, and consists in a construction of machine which shall perform upon rice passed through it the several operations of hulling or removing the hulls or husks, separating them, the brown meal and the hulled grains from each other, "milling" or cleaning and polishing the rice, separating therefrom what is known as the "polisher meal," and assorting the polished rice, or in other words, separating from each other the large rice, the small rice, and the "seconds."

A.D. 1874, January 17.—No. 223.

LEA, William Edgar, of Runcorn, in the county of Chester, ironmonger.—" Improvements connected " with and in reciprocating hydraulic motive power engines."

The first part consists in forcing or admitting air or gas into the liquid supply pipe amongst the liquid or into the cylinder or cylinders, so as to diminish concussion and strain caused by the reversal of motion of the actuating liquid at each end of the stroke.

The second part consists in securing to the slide valve controlling the motion of the actuating liquid a rod having a piston attached at each end, the whole being contained in a small cylinder alongside the main cylinder. The slide valve is operated by the pressure of the actuating fluid on the said pistons, which pressure is controlled by tappet valves in the main cylinder operated by the main piston.

A.D. 1874, January 17.—No. 224.

SMITH, George, of Newcastle, in the county of Northumberland, chemist.—" Improvements in the manufacture of bichromate of potash."

The novelty in this case consists in obtaining a more intimate mixture of the chromate of iron ore and alkali by dissolving the alkali before mixing it with the ore, and in the addition of unburnt Irish lime to the compound, and also in the use of carbonate of soda as part of the alkali.

A.D. 1874, January 17.—No. 225.

TODD, Leonard Jennett, of Leith, in the county of Midlothian, North Britain, engineer.—" Improvements in tramway locomotives and in boilers for the same."

This invention has principally for its objects the arranging of the driving platform and break gear of locomotives and cars for tramways in an improved and superior manner and the proportioning of boilers for the same, so that they can be much more safely worked than is at present the case when only a single attendant is employed to both drive the car and also attend to the boiler.

A.D. 1874, January 17.—No. 226.

LAMONT, James, of the city of Glasgow, in the county of Lanark, North Britain, plumber.—" Improvements in water closets, and in service cisterns for these and other purposes."

This invention consists, first, of an improved construction of watercloset, in which the discharge conical end of the porcelain basin is made longer than usual, and jointed on the one end of the close top of the discharge chest, so as to dip down into a bowl-shaped trapping chamber formed below it by a division, under and over which end and division the soil flows, by the force of the water at every flushing of the basin, down into the discharge soil pipe at the bottom of the other end of the chest, which is fitted with a small ventilating pipe conducted through the roof or to the outside of the house; the whole forming a simple, efficient, and close watercloset without movable discharge plug, pan, or other movable valves. The water is supplied to the basin by the ordinary service pipe and spreading "fan," from any of the ordinary water supply and regulating cisterns overhead; or from one of the improved construction forming the second part of these improvements; and consists of a double chambered cistern or chest, the one containing the water fitted with the usual service ball float valve and overflow pipe, to maintain the water in it at a normal level; the other chamber being dry in its normal state, but having a tilting scoop-shaped, water-measuring vessel mounted in it on a pivot screw pin at one side, and on a small bent arm tube passing through a fluid tight stuffing box at the other, to lead the water from the supply compartment into the tilting basin, when it and its filling bent tube are kept horizontal by a counterbalance weight. This measuring vessel is tilted by an arm and lever at one side and a wire or other equivalent carried down to the seat of the closet so as to be pulled by hand, or by the automatic action of the seat; all so as to raise the open mouth of the filling bent tube above the water in cistern, and to empty the contents of the tilting vessel over its scoop into its containing dry vessel, which lets the whole quickly down through the large service pipe fitted to its bottom, into the basin of the closet below, so as to flush it in the ordinary manner, or as before described, when applied to the improved closet forming the first part of this invention. So long as the measuring vessel is held in its tilted position no more water can be supplied, and when let go, its balance weight brings it an its filling tube to the normal position, so as to fill it in a reasonable time, depending on the diameter of th tube ready for the next action and flushing of the closet.

A.D. 1874, January 17.—No. 227.

ABRAHAMS, Abraham, of St. Peter's Park, in the county of Middlesex.—"An improved mode of and "apparatus for producing the evaporation of perfuming and other fluids."

This Provisional Specification describes a mode and apparatus according to which eau de cologne or other perfume, or camphor or other disinfectant is distilled with or dissolved in alcohol and placed in a vessel where it is submitted to the action of a platinum burner. This burner is a disc suspended above the liquid. The liquid being ignited, the platinum becomes red hot; the flame is then extinguished and sufficient air to support combustion is admitted through apertures in the cover of the vessel. The hydrogen evolved from the alcohol combines with the oxygen of the air, forming water which immediately evaporates, the intensity of the combination of these gases keeping the platinum at a red heat. The perfume or disinfectant being volatilized escapes into the room.

A.D. 1874, January 17.—No. 228.

BUTTERWORTH, Ellis, of Walton Place Works, Water Street, Rochdale, in the county of Lancaster. —"Certain improvements in machinery for preparing, spinning, doubling, winding, and reeling cotton and "other fibrous substances."

The invention relates to an improved footstep for supporting the spindles bored two sizes, the top part for receiving the body of the spindle, and the bottom part smaller to fit the foot of the spindle, the large part of the hole being continued down over part of the foot of the spindle to form a cavity for oil or other lubricant. Also to an improved bolster (for spindle rails without loose caps) made in two, three, or more parts, each having a flange or projection above and below the rail to prevent the bolsters coming out when at work. The different parts of the bolsters are adjusted by screws and locknuts to compensate for wear and prevent vibration.

A.D. 1874, January 17.—No. 229.

HARTMANN, William, and **HARTMANN,** Georg Heinrich Johannes, both of Basinghall Street, in the city of London.—"Improved apparatus for locking and unlocking railway carriage doors."

This invention consists in the employment of spring bolts or latches controlled by a ball governor operated directly from one of the wheel axles of the carriage in such manner that the bolts will be withdrawn by the weight of the balls when they fall on the stoppage of the train, and will be again shot by their springs on the starting of the train. Any doors left open at starting are also closed by the apparatus and locked.

A.D. 1874, January 17.—No. 230.

DUTTON, Samuel Telford, of Worcester, in the county of Worcester.—"Improvements in railway "facing points, and in working and securing the same."

For the purpose of this invention the switches are made from say twenty to twenty-two feet in length, and instead of connecting and moving the switch tongues together as at present, the inventor connects and moves them separately, either by the separate motion of two levers or the successive action of one lever, but in such a manner that only one tongue can be moved at a time; and also instead of connecting the rod moving them at one point to the switch as at present, he connects the switch to the single rod by cranks at two or more places in its length, thereby holding the switch firmly and equally against the stock rail at different points in its length.

To secure the facing tongue close up to the rail and keep it there, he fixes or places at the point of each tongue by preference a cam moving on a stud or centre on the point chair, each of the said cams being connected to and moved by the opposite switch.

It will follow that when either of the switch tongues is opened it will cause the other tongue, which then becomes the facing switch (if close up to the rail), to be secured in its place, and as the open or free switch cannot be closed while a train is passing or standing in them, the facing switch remains thereby secured.

In case anything should by design or accident prevent the proper closing of the facing point, it would be at once detected, for it would be impossible for the pointsman to move the other switch until the complete closing of the first.

Supplemental arrangements to meet special cases are also described.

A.D. 1874, January 17.—No. 231.

FORBES, The Reverend GRANVILLE HAMILTON, of Broughton Rectory, in the county of Northampton, Clerk in Holy Orders.—" Improvements in the purification of gas, and the manufacture of artificial fuel."

My invention relates to a new or improved compound for the purification of gas, and which, after being applied to that purpose, may be used for the manufacture of artificial fuel.

A.D. 1874, January 17.—No. 232.

FORBES, the Reverend GRANVILLE HAMILTON, of Broughton Rectory, in the county of Northampton, Clerk in Holy Orders.—" Improvements in the purification of gas."

This invention relates to a new method of utilizing the compound or compounds, for the manufacture of which Letters Patent, Nos. 1816, 1832, and 3783, A.D. 1873, were granted to me.

A.D. 1874, January 17.—No. 233.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Gormly Myers, of the city and state of New York, United States of America.*)—" An improved ventilating and warming apparatus."

The said invention relates to a novel, cheap, and simple apparatus for effecting the supply of fresh air to the rooms of dwelling houses and other rooms or apartments, and for warming or heating the same in a convenient and comfortable manner. The said apparatus may be placed over a gas or other burner or over any suitable heater.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

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ridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 11 to July 17, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, January 19.—No. 239.

ROADFOOT, James, of Glasgow, in the county of Lanark, North Britain, engineer.—" Improvements in pumps."

In carrying out the invention each piston rod has formed on it or attached to it a crosshead frame made ith a rectangular slot. Each crank bush is made in two halves, which can be put in place and screwed ogether after the crosshead frame is put over the cranks. Each bush is provided with a circle of anti-riction rollers, and these rollers are kept in their proper relative positions by rings at the sides, these rings being cut into halves to admit of their being got into their places.

A.D. 1874, January 19.—No. 242.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent. —(*A communication from Clement Louis Liotard, junior, of Paris, France, manufacturer.*) — " Improvements in gas burners with lateral and covered jets."

This burner, formed of one or more concentric rings with one or several feeders placed horizontally or vertically, is composed of two principal parts, a lower fixed part and an upper movable part, the horizontal covered jets being made either on the one or the other, or it may be a mushroom burner.

The invention comprises the production of the jet in the casting of the burner; a system of overlapping covers or lids, whether for ring or mushroom burners, whereby obstruction of the holes is prevented; a mode of fastening the covers to the lower part of the burners by bayonet joint; a cast-iron handle with draught orifice beneath, the object of which is to simplify the workmanship, lessen the quantity of material, and at the same time regulate the arrival of the air so as to obtain perfect combustion of the gas; and replacing screw fastenings by a key of special construction to facilitate fixing, cleaning, and repair.

This burner is applicable to all kinds of apparatuses for heating by gas, kitchen ranges for example, and manufacturing or chemical apparatus.

A.D. 1874, January 20.—No. 253.

LARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A ommunication from William Edward Sawyer, of Washington, district of Columbia, United States of America.*) —" Improvements in electric telegraph apparatus, and in alphabetical symbols for use in transmitting telegraphic messages."

The invention relates to the use with a galvanometer needle of a crosspiece with eye, by which a ray of ht is transmitted onto a moving photographically sensitized tape of paper, so as to record the movements the needle thereon by connected or disconnected angular lines or symbols, a set of which forms an habet that is more easily read and occupies less space than those heretofore employed.

A.D. 1874, January 21.—No. 257.

X, Thomas, upholsterer, of 77, Bishopsgate Street Within, parish of St. Ethelburga, in the city of don.—" A new spring mattrass or platform for bedding."

spring platform formed with jointed horizontal spiral springs and webbing, supported by pullies &

A.D. 1874, January 23.—No. 285.

PAKENHAM, Thomas, of Cork Street, in the county of the city of Dublin, bacon and ham curer.—"Improvements in singeing pigs by the application of gas, thereby saving fuel and labour, and maintaining an "equalization of heat, and the apparatus connected therewith."

The use of a gas chamber formed by the annular space between two vertical cylinders placed one within the other concentrically.

The gas chamber being supplied by pipes, the inner cylinder being supplied with burners with nipples inwards. A vertical cylinder being placed on the top of the gas chamber and fitted with doors or dampers to regulate the heat or air current; a chain with hook passing up the centre of the cylinders and attached to a pulley and windlass by which it is raised and lowered. The gas being admitted and burners lighted, the interior of inner cylinder is filled with flame, the chain is adjusted, the hook being on the level of a horizontal iron bar, on which the carcases of pigs are slung attached to gambols. The gambol is attached to the hook and rapidly raised until the entire carcase has been passed through the inner cylinder; and is then lowered and process repeated (if necessary) till singeing complete.

A.D. 1874, January 26.—No. 330.

CANNON, Thomas, of the firm of Edward Cannon & Sons, of the city of Dublin, Ireland, glue manufacturers.—"Improved machinery or apparatus for preparing materials for the manufacture of glue."

The invention consists mainly in an improved construction and arrangement of the rotating tumbler or drum in which the materials are prepared or heated.

The tumbler as constructed according to my improvements differs from the ordinary at all times open thick wooden tumbler, in that it is made of iron or other suitable metal and is constructed so that it can be used as an open or as a closed tumbler, and is divided into compartments by diagonal plates of metal instead of of wood as hitherto.

My improvements therein consist further in forming or providing the circumference of each compartment at one part with a doorway which is closed or shut by a hinged door secured by pins, and at another or other parts with cuts, holes, slots, slits, or other perforations, which being left uncovered form the said open tumbler, or which may be covered by removable shutter doors to form the said closed tumbler.

The shaft on and with which this improved tumbler rotates is also made of metal and receives the inn edges of the metal diagonal plates, and is made hollow with radiating slits or apertures leading through i circumference to the compartments of the tumbler.

The bearings of the shaft are placed on side bricks or other supports between which the improved tumbl is situated.

At each of its ends the shaft is connected with a system or arrangement of pipes (provided with thr cocks or taps, or with a three way cock or tap,) which communicate with a water main and also with a acid tank placed on suitable supports above the tumbler.

The tumbler as above constructed and arranged may be actuated by the system of driving gear heretofo in use for driving the ordinary open wooden tumbler.

At the time of supplying the compartments with the materials to be treated, the tumbler is turned in th proper direction by a hand or spoke-wheel placed on the squared-end of a spindle or shaft carrying a doubl acting ratchet wheel, controlled by a double-acting or two separate pawls, and also a pinion in gear wi the driving wheel on the tumbler shaft.

A.D. 1874, January 28.—No. 354.

GILBEE, William Armand, of the firm of L. de Fontainemoreau and Co., 4, South Street, Finsbury, the county of Middlesex, patent agent.—(*A communication from Emil Boëthius, of Stockholm, in the Kingdo of Sweden.*)—"Improvements in cork cutting machinery, parts of such improvements being applicable "other purposes."

This improved machinery is designed and constructed with a view to operate on the same principle as th followed in cutting corks by hand, and whereby it is rendered applicable to all kinds of the raw material, a economy of labour is effected, and the machinery is easily worked. The improved machinery is applicab to cutting various sizes of corks, whether of a cylindrical, conical, or oval form.

The first part of these improvements relates to an improved machine for cutting or dividing the cork-woo or bark into strips, the machine being provided with a circular rotary knife or cutter, and an arrangement rollers for sharpening the said knife or cutter fixed in a moveable frame.

The second part of these improvements relates to an improved machine for paring or barking the strips of cork made from thick bark. In this machine the whetting rollers for sharpening the circular rotary knife or cutter are attached to a directing bar running in guides at the sides of the moveable frame carrying the knife.

The third part of these improvements relates to an improved machine for cutting the strips of cork into pieces or squares suitable to be made into corks. This machine is also provided with a moveable frame carrying a circular rotary knife and whetting rollers so arranged that an intermittent up and down motion is communicated to the knife, the whole being so arranged that the breadth of the piece of cork cut by the knife is determined by the width of the strip.

The knives and whetting rollers hereinbefore described are applicable to cutting other materials than cork, such as paper, pasteboard, and india rubber.

The fourth part of these improvements relates to an improved machine for cutting or shaping the pieces of cork into corks for bottles. In this machine the knife, which is straight, has a forward and backward motion, obtained by gearing working an arm connected to the knife bar, and the whetting apparatus is moveable. An apparatus is also provided for the introduction of the cork, and also with an arrangement for giving the cork an oval shape.

A.D. 1874, February 20.—No. 652.

STENHOUSE, John, of Rodney Street, Pentonville, in the county of Middlesex, analytical chemist.—"Improvements in the manufacture of sugar, and in purifying saccharine solutions."

The essential feature of this invention consists in effecting the removal of lime, existing either as saccharate of lime or otherwise, from solutions of sugar or other saccharine solutions, by means of oxalic acid, or by means of the oxalates of ammonia, potash, or soda, or mixtures of the same.

A.D. 1874, July 11.—No. 2436.

BLAND, John, of Keighley, in the county of York, machine maker.—"Improvements in looms."

This invention relates to certain improvements in the method of and apparatus for regulating the supply of warp from the beam to the loom without any ropes or chains hitherto in use for this purpose. The object of my improvement is to insure the constant and uniform supply of warp pick and pick, thus insuring an even piece without the constant care and attention of the weaver, hitherto required in adjusting the weights; when heavy warps are used my improvement can be applied to both ends of the loom, and can with one or both applications be made to work in half the time required for arrangements consisting of ropes or chains.

A.D. 1874, July 14.—No. 2460.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from John M. Gouch Beath, of San Francisco, in the state of California, United States of North America.*)—"Improvements in the method and apparatus for cooling, refrigerating, and making ice."

My improvement consists in constructing an apparatus for making artificial ice without the necessity of removing the ice, to continue the process until required for market, or applied to use.

A.D. 1874, July 14.—No. 2465.

PRICE, John, of Sunderland, in the county of Durham, gentleman.—"Improvements in the construction and fitting of vessels for facilitating the loading of the same."

In constructing and fitting vessels so as to facilitate the loading of the same, a lateral expansion is given to the sides or combings of the hatchways, the object being to facilitate the inflow into and distribution in the vessel's holds of loose cargoes carried in bulk, and to furnish the means of fitting and attaching in the most useful manner adjustable shoots for directing the cargo as it enters the vessel's hold.

A.D. 1874, July 15.—No. 2475.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Gerard Dunning and Charles B. George, both of Waukegan, Illinois, United States of America.*)—"Improvements in horse-shoes."

My invention consists in providing a horse shoe with a series of side caulks of peculiar construction, and with a heel caulk cut away to form two bearing surfaces.

A.D. 1874, July 15.—No. 2476.

COLLICOTT, John, of Boston, in the county of Suffolk and state of Massachusetts, one of the United States of America.—" Improvements in boiler tube scrapers."

In this invention springs spread the arms into the proper shape and position for cleaning the boiler tubes and are protected from the heat, and thus prevented from being injuriously affected thereby, by being placed in a chambered or hollow hub; a partition cast in the mouth of the hub affords additional protection.

A.D. 1874, July 16.—No. 2497.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Francis J. Rabbeth, of Pawtucket, Rhode Island, United States of America.*)—" Improvements in spinning machine spindles, and in bolsters for the same."

The first part of the present improvements consists in an arrangement for obtaining the necessary oil chamber or reservoir when the sleeve portion of the compound spindle is made of a diameter small enough to admit of being surrounded by a bobbin. The next feature of my invention consists in an improvement in the bolster bearing for the upper journal of the spindle.

A.D. 1874, July 16.—No. 2498.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from George Washington Miltimore, of Janesville in the county of Rock, state of Wisconsin, and Moro Phillips, and Richard Henry Morris, both of Philadelphia, in the county of Philadelphia, state of Pennsylvania, both in the United States of America.*)—" Improvements in railway carriage axles."

The object of this invention is to allow each wheel a separate and independent revolving movement, thereby facilitating the movement of the carriage in rounding a curve, and compensating for any difference there may be in the diameter of the wheels, and consists of a hollow revolving sleeve axle upon which are loosely mounted the wheels, the said hollow axle being supported on, and revolving round a solid fixed axle, and so arranged as to revolve thereon simultaneously with an independent revolving movement of the wheels.

The invention also relates to means employed for lubricating the wearing surfaces, also to provision made for lateral motion of the sleeve and the wheels on the axle.

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[cylinders.
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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 18 to January 24, 1874.

A.D. 1874, January 19.—No. 234.

CINTOSH, John, of Westminster, in the county of Middlesex.—"Improvements in the manufacture f cigarettes."

This invention has for its object an improvement in the manufacture of cigarettes, and consists in apply- waterproof varnish to the ends of the paper which the cigarettes are made from.

A.D. 1874, January 19.—No. 235.

AIR, Thomas Thompson, of Liverpool, in the county of Lancaster, painter.—"Improvements in compositions for coating the bottoms of ships and submerged structures."

The object here is to provide an antifouling and protective composition ready for application without ting.

Under the first part any varnish, gum, resin, spirits of wine or a hydro-carbon, quicksilver, arsenic, a gment, and boiled oil are used in combination, mixed to a proper consistency by agitation or grinding.

Under the second part lime, magnesia, and clay are used with the substances employed under the first rt, the whole being incorporated by heating, mixing, and grinding in a novel manner.

A.D. 1874, January 19.—No. 236.

OBINSON, Thomas, of Widnes, in the county of Lancaster, ironfounder.—"An improved caustic soda boiler or concentrator."

This has external and internal shells, is open at the top, and is by preference made of cast iron.

Within the internal shell is a firegrate at a distance above the bottom: over the firegrate is the com- stion chamber: through the combustion chamber, preferably diagonally and crossing each other, are liquid bes. The uptake is led from the combustion chamber; and around the uptake is a feed heating chamber space.

Economy of fuel, durability, and absence of liability to damage are the objects of the invention.

A.D. 1874, January 19.—No. 237.

PPINCOTT, Charles Augustus, of Aylesbury, in the county of Bucks.—(*A communication from orge Conklin, of New York, in the United States of America.*)—"Improvements in the manufacture of condensed milk."

This invention relates to an improved process for making condensed milk without sugar, by which the vor and consistency of the milk are improved, and the milk is also better preserved than by the ordinary ocess of condensing, whilst the product is almost free from any flavour acquired by boiling.

In carrying out this invention the milk is first condensed in a vacuum pan in the usual manner, but at e close of the process the vacuum is broken, after which a quantity of crude milk or water is added to the ndensed milk in the vacuum pan, and the heat raised to a temperature exceeding 150 degrees Fahrenheit.

A.D. 1874, January 19.—No. 238.

ATHIESON, James, of West Ham, in the county of Essex, electrician.—"An improved mode of protecting torpedoes from premature explosion."

This invention consists in making the locking or guard contrivance of a torpedoe of a composition or ment that is soluble in water. Thus instead of having to remove the guard by hand as at present, I rely pon the slow action of the water to destroy its consistency and thereby leave the firing device free to act.

A.D. 1874, January 19.—No. 239.

BROADFOOT, James, of Glasgow, in the county of Lanark, North Britain, engineer.—"Improvements in "pumps."

In carrying out the invention each piston rod has formed on it or attached to it a crosshead frame made with a rectangular slot. Each crank bush is made in two halves, which can be put in place and screwed together after the crosshead frame is put over the cranks. Each bush is provided with a circle of anti-friction rollers, and these rollers are kept in their proper relative positions by rings at the sides, these rings being cut into halves to admit of their being got into their places.

A.D. 1874, January 19.—No. 240.

MACMILLAN, Neil, senior, of Glasgow, in the county of Lanark, North Britain, finisher.—"Improvements in finishing or treating woven fabrics."

This invention has for its object the finishing or treating of woven fabrics in a superior manner, and relates to an arrangement of apparatus, an important novel feature of which is the performance by it of the combined operations of dressing and hot pressing, instead of these operations having to be performed by separate machines, as ordinarily practised. The improved apparatus can also be very easily adjusted or arranged for giving different finishes or degrees of finish to the fabrics passed through it.

A.D. 1874, January 19.—No. 241.

MILLER, John, of Aberdeen, in the county of Aberdeen, North Britain, manufacturing chemist.—"Improvements in treating animal size for the obtainment of glue and other products."

This invention relates to the treatment of animal size, such as is produced when boiling or steaming cattle bones, fish bones, horn piths, scrows, or other animal matters of a gelatinous nature, and consists in adding to the hot size as drained from the bones or other materials a suitable organic acid, such as acetic acid, which precipitates chondrin or ingredients which have a diliquescent or otherwise injurious action.

A.D. 1874, January 19.—No. 242.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Clement Louis Liotard, junior, of Paris, France, manufacturer.*)—"Improvements in gas burners with lateral and covered jets."

This burner, formed of one or more concentric rings with one or several feeders placed horizontally or vertically, is composed of two principal parts, a lower fixed part, and an upper movable part, the horizontal covered jets being made either on the one or the other, or it may be a mushroom burner.

The invention comprises the production of the jet in the casting of the burner; a system of overlapping covers or lids, whether for ring or mushroom burners, whereby obstruction of the holes is prevented; a mode of fastening the covers to the lower part of the burners by bayonet joint; a cast-iron handle with draught orifice beneath, the object of which is to simplify the workmanship, lessen the quantity of material, and at the same time regulate the arrival of the air so as to obtain perfect combustion of the gas; and replacing screw fastenings by a key of special construction to facilitate fixing, cleaning, and repair.

This burner is applicable to all kinds of apparatuses for heating by gas, kitchen ranges for example, and manufacturing or chemical apparatus.

A.D. 1874, January 19.—No. 243.

LIDDALL, Joseph, and **GUTTERIDGE, Francis**, of the firm of J. Liddall and Company, of Dewsbury, in the county of York, tinners and braziers.—"Improvements in oil lamps."

This invention has for its object the construction of oil lamps in such manner as that no low deck or waste compartment is required, that no oil can escape even when tilted, that the "wick" may be readily introduced or removed, that the supply of oil may be regulated or controlled at will, and that in the event of the supply being at any time more than needed, the surplus will by a self-acting appliance be removed to the oil chamber.

A.D. 1874, January 19.—No. 244.

WHITELEY, William, of the firm of William Whiteley and Sons, of Lockwood, near Huddersfield, in the ounty of York, machine makers, and **HARLING, George**, of the same place, foreman.—" Improvements in looms for weaving."

This invention relates :—

Firstly, to means of driving looms.

Secondly, to means of working "rising boxes" or change shuttle boxes in looms having three or more of uch boxes; and,

Thirdly,—to improved arrangements for operating the tappets for working the healds in top centred ooms.

A.D. 1874, January 19.—No. 245.

VAN DE WEERD, Roelof, of Enschede, Holland.—" Improved means of and apparatus for producing " motive power and for driving mechanism."

This consists of a drum with balanced blades upon it, which can present a flat surface to an incoming current of fluid, and assume a vertical position on leaving it. The fluid thus causes the drum to revolve and to drive machinery placed in contact therewith by gearing.

A.D. 1874, January 19.—No. 246.

VAUGHAN, Edward Primerose Howard, F.C.S., of 54, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Eugène Albert Dubois, residing at Paris, in the Republic of France.*)— " Improvements in apparatus for generating inflammable gas by the carburization of atmospheric air."

This invention relates to improvements in the construction of those types of carburetters in which the volute or other mixing and forcing apparatus is mounted on a tubular shaft driven by weights or other motor. The improvements mainly consist in reducing the friction of the shaft and other moving parts by limiting the said shaft to the length of the generating chamber, and mounting the same on special bearings in connection with a spring or other motor; and furthermore, in providing regulating mechanism in combination with the gasometer, by means of which due equilibrium is maintained between the production and consumption of the gas, and the expenditure of driving power.

A.D. 1874, January 19.—No. 247.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Anthony Pollok, of Washington, district of Columbia, United States of America.*)—" Improve- " ments in shoe tips."

This invention consists in the manufacture of metal shoe tips which are enamelled on the exposed surface, of any desired color, in lieu of being covered with rubber, japan-black, varnish, or paint.

A.D. 1874, January 19.—No. 248.

EASTON, William, and **TATTERSALL, Frederick**, both of the Alexandra Foundry, Kirkstall Road, Leeds, in the county of York.—" Improvements in machinery for moulding bricks and other blocks."

The machine consists of a circular table or disc revolving continuously, and having moulding cavities in its face which are closed at the bottom by pistons. After a mould has been filled a pressure plate comes over it and descends into the mould whilst the piston rises, and so the brick is pressed on both sides simultaneously.

A.D. 1874, January 19.—No. 249.

PATTISON, Gurney Crow, of Baltimore city, state of Maryland, in the United States of America.— " Improvements in fog signals and alarm bells to be used on a vessel, or at lighthouses, shoals, or other " places."

This Provisional Specification describes modes of ringing bells by the motion of the waves or by the flow of the tide.

A.D. 1874, January 20.—No. 250.

SMITH, James Henry, of Albion Works, Lansdowne Road, London Fields, London, in the county of Middlesex.—" Improvements in sewing machines."

1st. An adjustable presser spring and foot steadier, having for its object to dispense with coiled spring and steady pins as generally used by other machines. The same consists of a flat spring so made and applied that it fits into a cross slot in a convenient part of the presser spindle.

2nd. Cotton take-up actuated by a cam on revolving shaft whereby the take-up can be timed. In conjunction with the same I also claim a stud with flat spring on it, or washers moving up and down with needle bar, between which the cotton as passed, having for its object the prevention of missing stitches and drawing up the last loop tightly.

3rd. Compensating plate on irregular or cam motions as applied either to needle bar or shuttle carrier for the purpose of always keeping the same tight on roller or part working in the slot, and so placed that it works on a joint or socket, and is kept up by a spring.

4th. Shuttle lifter for raising the shuttle out of the shuttle-box, thereby obviating the necessity of using any instrument for raising the shuttle at the risk of injury to the shuttle or shuttle box. In conjunction with the same a flat spring or other device for the purpose of keeping the shuttle down and restraining the thread from passing over the shuttle too quickly.

A.D. 1874, January 20.—No. 251.

ABRAHAMS, Abraham, of Saint Peter's Park, in the county of Middlesex.—" Improvements applicable " to gas and other lamps."

This invention has reference to lamps which are surrounded by colored or uncolored glass or other transparent or partly transparent material bearing pictures, designs, advertisements, or other figures, and relates more particularly to means of imparting rotation and of facilitating the rotation of the said glass or other material, also to the use of reflectors.

A.D. 1874, January 20.—No. 252.

LEWIS, George, and **LEWIS, Alfred**, both of Albert Works, Kettering, in the county of Northampton, engineers.—" Improvements in trucks or barrows, more especially intended for carrying, elevating, " emptying, and filling sacks, loading them into waggons or carts or other vehicles, and other like " operations."

Sack elevator, sack holder, and sack tilter on trucks or barrows.

A.D. 1874, January 20.—No. 253.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Edward Sawyer, of Washington, district of Columbia, United States of America.*) —" Improvements in electric telegraph apparatus, and in alphabetical symbols for use in transmitting " telegraphic messages."

The invention relates to the use with a galvanometer needle of a crosspiece with eye, by which a ray of light is transmitted onto a moving photographically sensitized tape of paper, so as to record the movements of the needle thereon by connected or disconnected angular lines or symbols, a set of which forms an alphabet that is more easily read and occupies less space than those heretofore employed.

A.D. 1874, January 20.—No. 254.

SYNGE, Millington, Henry, of the United Service Club, Pall Mall, in the county of Middlesex, Major General, Royal Engineers,—" Improved apparatus for deodorizing and discharging fluids, and for trapping " sinks, drain pipes and tanks."

This invention relates to a novel appliance for containing charcoal and presenting it in such a manner as to make its filtering and deodorizing qualities applicable to a variety of domestic uses.

A.D. 1874, January 20.—No. 255.

SYNGE, Millington Henry, of the United Service Club, Pall Mall, in the county of Middlesex, Major General, Royal Engineers.—"Improved apparatus for filtering and purifying the drainage of houses and "streets."

This invention consists in rendering the drainage of houses innocuous, for the purpose of watering roads, cleaning streets, and other kindred uses.

For this purpose a given number of houses are grouped together to drain them into a series of filtering tanks which may be arranged under the footway. Access will be given to these tanks by means of manholes.

A.D. 1874, January 21.—No. 256.

STEARNS, Joseph Barker, of Boston, Massachusetts, United States of America, now of No. 8, Southampton Buildings, London, electrician.—(*Partly a communication from James C. Upham, of Sydney, Cape Breton, Nova Scotia.*)—"Improvements in electric telegraph-apparatus."

This invention relates to telegraphic apparatus whereby two different messages may be transmitted at the same time in one direction upon a single wire, and either one message or two different messages may be transmitted in the opposite direction at the same time upon the said wire, that is to say, two, three, or four messages may be sent at the same time through a single wire or cable.

A.D. 1874, January 21.—No. 257.

FOX, Thomas, upholsterer, of 77, Bishopsgate Street Within, parish of St. Ethelburga, in the city of London.—"A new spring mattrass or platform for bedding."

A spring platform formed with jointed horizontal spiral springs and webbing, supported by pullies & ropes.

A.D. 1874, January 21.—No. 258.

HARVEY, John Francis, of No. 145, Strand, in the county of Middlesex, umbrella manufacturer.—"Improvements in umbrellas, parasols, and sunshades."

The object of the invention is to facilitate the holding and releasing of the runners of umbrellas, parasols, and sunshades, and to avoid the necessity for cutting or otherwise forming openings in the "sticks" or stems thereof for the holding springs.

For this purpose the stick or stem has projections applied to it, adapted one to hold the umbrella, parasol, or sunshade open, the other closed, when either is embraced by one of a pair of bayonet or such like openings in the runner tube. The runner wheel is separate from the runner tube, to admit of the runner tube making a partial rotary motion in the wheel, which also carries projections adapted to act by spring pressure upon the stud for the time in the runner and prevent it from too freely releasing itself.

A.D. 1874, January 21.—No. 259.

KINDER, Edmund Cornelius, and **KINDER, Joseph Thornton**, both of Stratford, in the county of Essex.—"An improved arrangement and construction of combined cabinet and automaton smoking or "fumigating apparatus."

The invention consists in producing a cabinet that will combine the novelty of containing cigars or other material together with an arrangement of inclosed mechanism that will when wound up actuate a bellows like chamber, provided with inlet and outlet valves and pipes, in such a manner that tobacco or other weed ignited and placed in a bowl over the inlet pipe will have its fume or smoke drawn into the bellows and ejected therefrom through the outlet pipe, the two operations being continued alternately so long as the mechanism is in action.

A.D. 1874, January 21.—No. 260.

STRACHAN, James, of Campfield Lodge, Saint Peter's Park, Paddington, in the county of Middlesex, stockbroker.—"Improvements in cheques and similar documents for banking and other purposes."

The issuing with cheques and other documents representing money, tickets or labels signed by and which identify the signature of the person entitled to draw or negotiate such cheques or documents.

A.D. 1874, January 21.—No. 261.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Charles H. Leighton, of Lowell, Massachusetts, United States of America.*) —" Improvements in lamps."

This invention relates to the combination of a centre-draft tube, having upon it a washer and one lock-nut, with the bowl of a lamp; to the combination of certain operating parts for diminishing or increasing the combustion on the wick; to the combination of a centre-draft tube, having upon the same a washer and two lock-nuts, with the bowl and stand of a lamp; and to the combination of the centre-draft tube, wick, and inside bushing, with the bowl of the lamp.

A.D. 1874, January 21.—No. 262.

WOODS, John Edward Tenison, of 2, Hillsborough Villas, West, Kensington Park, in the county of Middlesex, chemical engineer.—" Improvements in the construction of steam and other boilers."

The improvement consists of the application of a closed wrought iron tube to the interior of the tube or tubes of boilers made on the construction known as the Cornish system, and connecting the same in various places by collar pieces and tubes with the water space of such boiler in any suitable manner, so as to compel the heated gases to pass through the annular space between the outside of the inner wrought iron tube and the inside of the Cornish tube, by which a double heating surface is obtained and a better circulation of the water in the boiler secured.

A.D. 1874, January 21.—No. 263.

LOMAX, Henry, of Over Darwen, in the county of Lancaster, sewing machine maker, and **BRADBURY**, George Francis, of Oldham, in the county aforesaid, sewing machine maker.—" Improvements in sewing " machines."

This invention consists in the use and employment of a grooved or slotted lever (and link or other mechanical equivalent) for the purpose of actuating and imparting proper time and motion to the needle, in lieu of other movements for the same purpose, and also to secure a more ample supply of thread to the needle, by means of which a larger shuttle may be used without having to increase the length of stroke of the needle.

A.D. 1874, January 21.—No. 264.

MAW, Arthur, of Benthall Works, near Broseley, in the county of Salop, encaustic tile manufacturer.—" Improvements in metal moulds or dies used in the manufacture of earthenware or china from clay in the " powdered state by means of compression, which improvements are specially applicable to the manufacture " of pots and jars."

My invention consists in the construction and operation of metal moulds or dies, so formed as to give a vertical compression to the powdered clay in proportion to the depth or thickness of the various parts of the object to be moulded. Also in a plan for applying pressure by hydraulic power from within, both vertically and laterally, or where necessary, in every direction at the same time, the object being in each case to compress and consolidate powdered clay instead of the usual process of moulding such articles out of plastic clay.

A.D. 1874, January 21.—No. 265.

MONCKTON, Edward Henry Cradock, of Fineshade, Northamptonshire.—" Improvements in magnetic engines, and in producing motive power, & in the apparatus for producing such motive power."

The object of this patent is—

Firstly. To produce motive power by means of electro magnetic engines of novel construction, of a greater power than those hitherto made.

Secondly. To insulate every part of the apparatus, including the magnets and rotating wheels, moveable bars or levers.

Thirdly. To add condensers of electricity as described to the magnets.

Fourthly. To utilise in various ways the electrical currents generated.

Fifthly. To construct novel batteries and condensers.

Sixthly. To combine well known electrical processes in new forms, by which to obtain results hitherto not arrived at.

A.D. 1874, January 21.—No. 266.

MOLLOY, Bernard Charles, of the Temple, barrister at law, and FITZGERALD, Desmond Gerald, of Brixton, in the county of Middlesex, electrician.—"Improvements in the manufacture of white lead."

The essential features of this invention consists in the production of what is known as white lead, carbonate of lead, or bassic carbonate of lead, by effecting the decomposition of chloride and of oxychloride of lead by means of an earthy carbonate, or by means of an earthy carbonate in conjunction with an alkaline earth or the hydrate of the same.

A.D. 1874, January 22.—No. 267.

MORRILL, James, of Pocklington, East York.—"Improvements in pinch bars for removing railway waggons or carriages, or other heavy bodies."

The improvement consists in shoeing the iron plate to which the lever or pinch bar is attached with wood or any other substance that may serve to prevent the plate from slipping when the lever is being used for removing railway waggons, carriages, or other heavy bodies.

A.D. 1874, January 22.—No. 268.

GREENER, Henry, of Millfield, near Sunderland, in the county of Durham.—"Improvements in the manufacture of glass letters and figures, such as are used for ornamenting shop windows and for other similar uses."

This Provisional Specification describes means for forming the letters and figures by forcing melted glass into metal moulds.

A.D. 1874, January 22.—No. 269.

FORD, Alfred, of 20, Russell Square, Brighton, in the coy. of Sussex, gentleman.—"Improvements in the mode of cleansing cotton waste, and in utilizing the fluids employed therein."

The novelty consists in cleansing cotton waste from all the grease and grit which it contains, by washing it in turpentine, naptha, or petroleum, or some of these products, in the manner described in the Specification, and thereby rendering it in all respects as good and useful as it was when new, and this without the use of caustic alkali, or injuring the fibre, and in the method employed for recovering and reusing the spirits employed.

A.D. 1874, January 22.—No. 270.

WHITEMAN, William Thomas, of No. 35, Maitland Park Road, in the county of Middlesex, gentleman.—"Improvements in and apparatus for signalling on railways."

This invention consists in giving signals automatically on or to trains by means of electrical apparatus carried by such trains acting in conjunction with other electrical apparatus set on the permanent way.

A.D. 1874, January 22.—No. 271.

GRIFFIN, Thomas, of Derby, in the county of Derby, timber merchant.—"An improved coupling for driving belts."

Driving belts when at work will give out; and this necessitates the taking up or tightening of the same to prevent slipping on the belt pullies. The couplings also, from being uneven on their inner or friction surface, cause a tremor in the running belt, and thus put a strain upon the couplings which they cannot long resist. To avoid this inconvenience and at the same time provide a ready means for shortening the belt as it stretches or gives out, the ends of the belt are bent outwards and gripped between a pair of clamping plates of a length equal to the width of the belt. To one of these plates screwed pins are riveted; loose screws may be used in place thereof. These pins or screws are passed through the ends of the belt and through holes made in the corresponding clamping plate, and to the screws or screwed pins are fitted nuts which when turned will tighten up the clamp and grip the ends of the belt firmly together. When a strain is put upon the belt in working, the coupled part will take shape from the driving pulley and there will be no internal projection on the belt to detract from the smoothness of its working.

A.D. 1874, January 22.—No. 272.

WORSSAM, Charles, of Commercial Wharf, Kingsland Road, in the county of Middlesex, engineer.— "A new and improved motive power machine."

The novelty of the invention consists in placing endless gearing traversing straps provided with hollow and solid projections within a cistern or tank which when immersed on their external surfaces of gearing in water will through the medium of their buoyant hollow projections give a continuous traversing or revolving motion.

A.D. 1874, January 22.—No. 273.

JENSEN, Peter, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from H. [illegible], Gibson and Sons, Gothenburg, Sweden.*)—"Improvements in woodworking machinery."

Improvements in various machines, viz., a planing machine, large grooving machine, small grooving machine, and dovetailing machine. Revolving and other cutters, ribbed and other rollers for gripping and feeding and for holding down the "work."

A.D. 1874, January 22.—No. 274.

MARLOW, John Bewley, of Openshaw, near Manchester, in the county of Lancaster, engine driver, **ROEBUCK, Joseph**, of the same place, fitter, and **FALLOWS, John Thomas**, of Bradbury, in the county of Chester, manager.—"Improvements in railway points."

Our invention consists in making projections on the under side of the movable rails and corresponding holes in plates on which the movable plates rest; the outer ends of the movable rails are connected by a lifting plate, in which is a curved slot; in this slot is a bowl fitting on a stud in a lever, which lever is moved to and fro by a catch lever, the catch taking into notches in a sector plate. The movable rails are thus securely locked when the points are set.

A.D. 1874, January 22.—No. 275.

THOMPSON, William, of No. 5, Chestnut Walk, Stratford upon Avon, in the county of Warwick, architect and surveyor.—"Improvements in cutting, dressing, and moulding marble, stone, and slate."

In the Specification of a former Patent granted to me on the 20th day of October 1871 (No. 2802) was described an improved method of cutting and moulding marble, stone, and slate. In using this method I have found the sharp arises or cutting edges of the saws of moulding cutters apt to get damaged or broken, from the brittleness of the cement or composition I have been able to use in combination with the cutting substances employed.

According to this my present invention for an improved method of cutting and moulding marble, stone, and slate, I use corundum, emery, or other such like hard mineral cutting substance, secured to or fixed in holders made of steel or other suitable material.

For cutting blocks of marble, stone, or slate into slabs or other forms, I use straight blades of steel or iron, the edges of which are made to receive holders above described, and to which a reciprocating motion may be given. I also use discs of iron or steel having their edges made to receive the holders, and which may be mounted on an axis or spindle.

For moulding or otherwise surfacing stone and such like substance I use a metal block approximating to the counterpart of the moulding or surface to be produced. In the metal block, holes are made to receive the holders, spirally or otherwise, on its surface; the block having a hole through its centre, can be mounted on an axis or spindle and used in any convenient manner.

For rubbing the surfaces of stone and such like substance I use discs having holes on their faces or sides to receive the holders, which may be mounted on an axis or spindle; or I use a plate of metal having holes on its face to receive the holders, to which a reciprocating motion may be given.

A.D. 1874, January 22.—No. 276.

THOMPSON, Nathan, of the city of Brooklyn, and state of New York, in the United States of America, but at present of 23, Southampton Buildings, in the county of Middlesex, marine engineer.—"Improvements in stoppers or covers for bottles, jars and other hollow articles, and in appliances to be used therewith for the purpose of securing and removing the same when required."

For this purpose in connection with the stopper, or cover, a clip or strap is employed which passes over the top of the stopper or cover and takes a bearing thereon and against the underside of a flange on the neck of the article to be stopped; an incline being formed in connection therewith to press the stopper or cover firmly against the neck or end of the article to be stopped.

A suitable instrument is sometimes employed to facilitate the application and removal of the clip or strap.

A.D. 1874, January 22.—No. 277.

TYLOR, Alfred, and **TYLOR, Joseph John**, of No. 2, Newgate Street, in the city of London, brass founders.—"Improvements in apparatus and arrangements for containing, measuring, controlling, regulating, and arresting the supply of liquids and fluids; and preventing waste."

Forming service cisterns for water closets of porcelain, earthenware, stoneware, or other suitable plastic material glazed or otherwise rendered impervious to water; or forming them of glass, asphalte, bitumen, or waterproof material combined when necessary with fibrous material or materials, or iron or other metal netting, cloth, wire, or other similar combination embedded or enclosed in the substance in order to give strength and maintain form.

Arranging the cisterns to prevent waste and forming the same with three or more divisions, partitions or chambers communicating with three or more of the same, which communications are provided with one or more valves controlling the same operated by the actuating part so as to retain a portion of the water and always give a seal without rendering it necessary to empty the cistern, and the inlet and outlet openings cannot be open or partially open together. Also arranging cisterns with an air tight vessel, chamber, part, or receptacle provided with an air valve or valves and an opening or openings in the lower part, which vessel, chamber, or part closes the outlet and rises to let the water pass when the actuating arrangement is operated and whilst the water is passing out allows a portion of the same to enter it and cause it to descend and close the outlet on the desired quantity having been allowed to pass. This portion of water is retained until the actuating part is released when it flows out and seals or traps the pan, hopper, or receptacle.

Arranging a small meter or meters on a by pass or smaller pipe or passage connected with the larger pipe or channel through which the main body of water flows so that it shall enable the quantity of water passing through the large pipe to be measured by the quantity passing, through the smaller one acting on the meter or meters; and placing a valve or valves between the meter or meters and the water to act as a regulator, and assist in causing the same to register correctly.

Arranging submerged self closing "waste not" valves for use in cisterns so as to have a rotary or partially rotary movement caused by the parts in connection with the same working in inclined planes or slots formed in the actuating portions or by causing the actuating portions to work in such inclined planes or slots attached to or connected with the portion controlling the outlet orifice and forming on or attaching to the same resisting blades or projections, so that these parts in conjunction with the height of the lift and amount of incline of the planes or slots may enable the quantity of water passed to be regulated; and applying a guide or guides or slide bar or slide bars to regulate or confine the action of the parts to an upward and downward movement in addition to the rotary or partially rotary movement and thereby ensure the return of the valve or part controlling the outlet orifice to its seat, and also arranging the same so that they cannot be left or kept open or even partially open.

Arranging both valves so that the opening or closing one shall prevent or permit the opening or closing of another, and when both are closed the outlet can be opened.

Arranging push in valves to shut off without shock and so that the part closing the outlet orifice shall shut off the openings by which the water obtains access to the outlet; and arranging them so that they may become readily made.

A.D. 1874, January 22.—No. 278.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Henry Wardwell Shepard, of Brooklyn, and Robert Seaman, of New York, both in the state of New York, United States of America.*)—"Improvements in the construction of sheet-metal pails, cotton-cans, and other like vessels."

This invention has reference entirely to the bottoming of sheet metal vessels, particularly milk and water pails, and what are known as factory cotton and woollen cans.

A.D. 1874, January 22.—No. 279.

HICKISSON, James, of Southgate Road, Hackney, in the county of Middlesex, marking ink manufacturer. —" Improvements in the means of or apparatus for stopping or stoppering bottles, jars, and other vessels of " capacity."

A magnetic, magneto electric, or electric stopper is combined with a suitable opening which receives it.

A.D. 1874, January 22.—No. 280.

LISTER, Samuel Cunliffe, of Manningham, in the county of York.—" Improvements in the combustion " of fuel, and in apparatus for the same."

This Provisional Specification describes forcing air, or steam, or inflammable gases, or all of them, through hollow perforated fire bars of the furnace, or through perforated pipes underneath the fire bars. Gases may also be introduced at the bridge. By these means shale or other poor fuel may be burned.

The bridge may be made of metal, and connected with the boiler by pipes. In this water chamber are placed pipes, through which the air, gas, or steam passes or is forced into the furnace.

A.D. 1874, January 22.—No. 281.

GRUBINSKI, Florian, of Warsaw, Poland.—" An improved mowing machine."

The improvements of said machine consist in (1) the movement of the scythe which is executed by levers and without any cog-wheels as in other known machines. (2) the arrangement of the pole, being independent of the machine, so that the horses have not to carry the whole weight of the machine when the front wheel sinks into a furrow. (3) the lever arrangement which enables the driver to lift up the machine instantly when stones or uneven ground require it.

(4.) The movement of the apparatus for bending the stalks against the scythe, and for throwing the corn off the machine, which is executed as well as the movement of the scythe, without the help of any cog-wheels, which lessens the cost of such a machine considerably.

(5.) The arrangement of having all mechanisms closed up, so that dust, sand, or grains, cannot enter between the mechanical parts, and the oil or grease which is introduced to lessen the friction remains always clean, and contributes considerably to the durability of the machine.

A.D. 1874, January 22.—No. 282.

STACY, George, of Guildford Street, Russell Square, in the county of Middlesex, gentleman.—" An " improved construction of hammer."

My invention may be described as an improved revolving hammer, and as consisting mainly in the combination of a rotary shaft or axle with a hammer or series of hammers hinged to said shaft or axle at a point or points some distance radially from the axis of rotation and capable of swinging backward on their hinges in the direction opposite to that of the rotation.

A.D. 1874, January 22.—No. 283.

SCOTT, Henry Young Darracott, of Ealing, in the county of Middlesex, Major General, C.B., and **SPENCE, John Berger**, of Manchester, in the county of Lancaster, merchant.—" Improvements in the " treatment of sewage and ammoniacal liquids."

The object of this invention is the treatment of sewage and ammonical liquids so as to abstract therefrom the ammonia present, in a cheap, portable, and stable form. When the liquid to be operated on has been clarified by removing the suspended matters by subsidence or precipitation.

We pass the clarified sewage through layers composed of natural phosphate of iron in the hydrated condition or of phosphate of iron. The phosphate salt or salts are then allowed to subside in combination with the ammonia abstracted from the liquid.

A.D. 1874, January 23.—No. 284.

MICHEÁ, Paul Philippe François, of Wassind Factory, Tamah District, in the Bombay Presidency, India, but at present of Nos. 17 and 18, Leadenhall Street, in the city of London.—" Improvements in " the production of tannin and canocarpine."

This invention relates, firstly, to a process for the production of tannin from tannin-bearing plants, trees, fruits, leaves, barks, or extracts thereof; and secondly, to the application of such process to the production of a substance known as canocarpine, a process for the production of which from the leaves of the canocarpus latifolia was described in the Specification to a Patent dated 20th September, 1872, No. 2786.

The tannin contained in the said plants, trees, &c., is first extracted by decoction or maceration in an aqueous solution of common salt, or in sea water, or in a solution of sulphate of soda, to which about one per cent. of a soluble salt of lime or magnesia is added. From the liquid thus obtained the tannin is precipitated by the addition of an alkali or alkaline earth.

The tannin compound thus precipitated is washed and is then suspended in water, and by the gradual addition of a free acid the precipitate is dissolved and a solution of tannin is obtained giving all the usual reactions of tannin.

For producing canocarpine from the leaves of the canocarpus latifolia, a decoction of the said leaves is subjected to fermentation until the tannin is destroyed, and the fermented liquid is then subjected to the above described process for the production of tannin, whereby a solution of canocarpine is obtained ready for use as a dye stuff.

A.D. 1874, January 23.—No. 285.

PAKENHAM, Thomas, of Cork Street, in the county of the city of Dublin, bacon and ham curer.—"Improvements in singeing pigs by the application of gas, thereby saving fuel and labour, and maintaining an "equalization of heat; and the apparatus connected therewith."

The use of a gas chamber formed by the annular space between two vertical cylinders placed one within the other concentrically.

The gas chamber being supplied by pipes, the inner cylinder being supplied with burners with nipples inwards. A vertical cylinder being placed on the top of the gas chamber and fitted with doors or dampers to regulate the heat or air current; a chain with hook passing up the centre of the cylinders and attached to a pulley and windlass by which it is raised and lowered. The gas being admitted and burners lighted, the interior of inner cylinder is filled with flame, the chain is adjusted, the hook being on the level of a horizontal iron bar, on which the carcases of pigs are slung attached to gambols. The gambol is attached to the hook and rapidly raised until the entire carcase has been passed through the inner cylinder; and is then lowered and process repeated (if necessary) till singeing complete.

A.D. 1874, January 23.—No. 286.

WALKER, Thomas, of No. 65, Robert Street, Chelsea, in the county of Middlesex.—"Improvements in "utilising the waste heat of steam engines; and apparatus therefor."

This invention relates to means of utilising the heat of the waste steam of steam engines to obtain additional motive power.

The waste steam is passed through a surface condenser cooled by volatilisable liquid, such as alcohol, ether, ammoniacal liquor, or other known liquids. The vapour generated from such liquid by the heat of the steam condensed is employed to work another engine or another piston of the steam engine, and afterwards condensed in a surface condenser, whence it is pumped back to the first condenser to be vaporised again.

A.D. 1874, January 23.—No. 287.

LACAZE, Alfred, of Vincennes, near Paris, France, manufacturer.—(*A communication from Louis Jean Baptiste Capon, a person resident at Vincennes, (France)*).—"An improved weaving loom."

This Provisional Specification describes means of imparting movement to the lay or batten and movement to the pickers; also means whereby the lay can, when desired, be left free and independent of the pickers, so that as many of the cards as required can be drawn back. Also an arrangement whereby the loom can be worked either by power or by a pedal as desired.

A.D. 1874, January 23.—No. 288.

SELLERS, William, of the Airedale Works, Keighley, in the county of York, sewing machine manufacturer.—"Improvements in sewing machines."

The improvements relate to means for holding the shuttle in position in its carrier when in use, and for facilitating its correct working against the face of the race.

For this purpose the swinging bracket or such like carrier for the shuttle is formed with a slide to hold the shuttle in position and to turn on a pivot as an axis towards one end of it, whilst the other end of it acts as a stop to hold the shuttle in its carrier.

This slide is operated by tappet motion, which when operated in one direction admits of the shuttle being introduced to or removed from its chamber or in the opposite direction of the shuttle being held in position.

The back of the groove forming the chamber for the shuttle has a slot or longitudinal opening in th direction of the length of the shuttle, to receive a slight spring to bear on the shuttle about midway betwee its top and bottom surfaces, to hold the shuttle to the face of the race.

A.D. 1874, January 23.—No. 289.

LOCKWOOD, Philip Embury, of 96, Leadenhall Street, in the city of London, gentleman.—"An "improved method of treating beer, ale, porter, and other beverages of a like nature."

I distil from beer, fermented or unfermented, a large proportion of its water, returning the alcohol obtained by re-distillation and mixing it with the extractive matters now containing but little water. This concentrated beer can be re-made into ordinary beer by the addition of water, aerated water, or water and carbonic acid mixed with it, by means of any aerating machine. The entire operation may be performed in vacuum pans adapted to rectifying stills of ordinary make, and the distillation is preferably conducted at a low temperature. When unfermented beer is concentrated it may be re-mixed with water at any time and worked with yeast in the ordinary way.

A.D. 1874, January 23.—No. 290.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from John Sketchley Morton, of Philadelphia, county of Philadelphia, and state of Pennsylvania, United States of America.*)—"Improvements in apparatus for propelling vessels."

According to this invention steam and water are brought in direct contact in cylinders or chambers having openings at their lower ends, through which the surrounding water is alternately admitted and expelled by a corresponding alternate steam pressure and vacuum therein, for propelling the vessel.

The invention includes the features of construction and arrangement of parts, and also provides for heating the air in the cylinders to prevent undue condensation of the steam.

A.D. 1874, January 23.—No. 291.

NOBLE, Frank Joseph, of Gateshead on Tyne, in the county of Durham.—"Improvements in ratchet "braces."

The improvements have for their object to provide a self-acting feed for the drill or tool of simple construction, and also to render the brace capable of being worked either right or left handed.

A.D. 1874, January 23.—No. 292.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Alonzo Paul La Grove, of the city, county, and state of New York, United States of America.*)—"An improved mechanical toy."

This consists of a figure with loosely jointed limbs to swing and move in imitation of dancing, the feet being also bevilled to assist the action. The motion of the figure is obtained by an arrangement of mechanism contained in a box on which the figure dances, and operated by clockwork or by hand.

A.D. 1874, January 23.—No. 293.

WALKER, Thomas, of No. 65, Robert Street, Chelsea, in the county of Middlesex.—"Improvements in "the means of transmitting electric currents for telegraphic and other purposes."

This invention relates to means of rendering an uninsulated or partially insulated wire available for the tansmission of electric currents, and to the partial insulation and protection by inexpensive materials of wires so employed.

Between the receiving instruments and the end of the wire next to it is interposed a battery preferably of iron to which the wire is connected with a less oxidisable metal to which the instrument is connected. The wire is then capable of transmitting electric currents sent into it at its distant end notwithstanding its defective insulation.

To form an insulating and protecting covering for such wires, compounds of lac, rosin, tar, oil are applied either as a paint or in more solid condition by means of a die, and tape or fibre served with such compounds to give adhesion.

A.D. 1874, January 23.—No. 294.

XBY, **John**, of Canterbury Road, Kilburn, in the county of Middlesex.—"Improvements in inter-
ocking apparatus for railway points and signals."

This invention relates to apparatus whereby when a lever of a system for working railway points and
nals is moved or about to be moved some other levers of the system are locked, and when a lever is
lled quite over some other levers are released.

Each lever or its spring catch is connected to a vertical rocking shaft having hollows in its circumference
d working a longitudinally sliding bar, and these sliding bars have projections or hollows on their edges.
Whenever a lever begins to be moved, or has its spring catch raised before moving the lever, its rocking
haft is turned partly round, and so presents an obstruction to such of the sliding bars as have projections
acing it. When the lever is moved fully over or its spring catch lowered, its rocking shaft is turned farther round so as to present a hollow to the projections of others of the sliding bars which are then free to be moved. And when the projection of any sliding bar is engaged in the hollow of a rocking shaft that shaft is prevented from turning. And thus by the connection of the sliding bars and rocking shafts to the several levers or their spring catches, the locking or releasing of some levers of the system is made to depend on the movement of some other lever or of its spring catch.

A.D. 1874, January 23.—No. 295.

RATH, **Ferdinand**, of Goldsmith Street, in the city of London.—"Improvements in rollers or apparatus "for making plaited, creased, or folded fabrics."

The rollers employed in accordance with these improvements for creasing the fabrics are formed with ribs and grooves which gear together in like manner to cogwheels, ribs and grooves, being formed with steps or sets off in them corresponding with the number and width of the creases required for producing (by subsequent folding) box or double box plaits.

The rollers are supported in bearings in a frame as is well understood, but according to my improvements the lower roller is supported and borne up against the upper roller by a spring or springs (or otherwise), the pressure of which can be adjusted.

A.D. 1874, January 23.—No. 296.

KING, **Frederick John**, of Bishopgate Avenue, in the city of London, merchant.—"Improvements in "the treatment and separation of ores and mineral products."

The essential points of this invention consists, first, in subjecting the ores containing sulphur, such, for example as iron pyrites to the action of heat, so as to convert such sulphurets as may be capable of being so rendered into a magnetic condition, and being thus converted from a nonmagnetic to a magnetic condition, or to such a condition as that they are rendered capable of being attracted by a magnet or magnets, and then separating the same by means of a magneto separator.

Second. In subjecting ores or mineral products containing the higher oxides of iron, such, for example, as the sesqui oxide to the action of heat, in conjunction with a reducing agent, so as to convert such oxides of iron into a magnetic condition, and being thus converted from a non-magnetic to a magnetic condition, or to such a condition as that they are rendered capable of being attracted by a magnet or magnets, and then separating the same by means of a magneto separator.

Thirdly. The employment of a magneto separating machine, so constructed as that the magnetic power or influence may pass through an endless band or medium, and thus cause to separate the magnetic substances which may be deposited thereon when in contact with the magnets or conducting agent, and which band or medium having passed from the source of magnetic power shall possess no magnetic influence, and thus the particles separated will fall and be deposited free from other constituents.

A.D. 1874, January 23.—No. 297.

SMITH, **John McIntyre**, of New York city, in the state of New York, in the United States of America. —(*A communication from Doctor Paul Edmond Audouit, of the city of Havre, in France, surgeon, in the service of the General Transatlantic Steamship Company, of France.*)—"A new medicinal compound, and "plasters made therewith."

One of the most important uses of the compound and of the plasters is to prevent sea sickness.

The following is a description of what is considered the best means of carrying out the invention.

Take of what is known as diachylon (in French "emplâtre de diachylon"), sometimes called court plaster (an oxyde of lead and oil), two grammes; with this thoroughly mix two grammes of theriac, or Venice treacle (in French "theriaque") and one gramme of extract of belladonna (in French "extrait belladonne"), and preserve the compound in a tight stoppered vessel.

To use the compound as a preventive or cure for sea sickness, spread it to about the thickness of an ordinary adhesive plaster on a small oval piece of kid or other soft leather.

One of these plasters being slightly warmed is applied and caused to stick on the pit of the stomach.

Thin muslin paper, thin vegetable parchment, and various other substances may be used with success instead of leather, as a foundation for the plaster.

A.D. 1874, January 23.—No. 298.

FINGER, Louis, of Boston, in the county of Suffolk, and state of Massachusetts, of the United States of America.—"Improvements in electro magnetic annunciators."

The invention relates to certain new and useful improvements in electro magnetic annunciators, having for their principal objects the providing of an annunciator, economical in cost and construction and simple and effective in operation, by which the article or person wanted is specified, as well as the room from which the order is issued or announced; and the time and labor heretofore rendered necessary in the use of ordinary annunciators, by the attendant being obliged to go to the apartment to ascertain the want of the occupant and then to obtain and return with the desired article, and the expense of the number of servants employed on account of the time thus required is greatly diminished.

Also by the employment of a single annunciator to indicate a number of articles or persons and the number of the room or place from which the order is given to save the expense and prevent the liability of the disarrangement of the operation heretofore incurred when more than one article, etc., was to be indicated by the use of a separate annunciator for each article, etc., desired.

The first part of this invention consists of an annunciator composed of two separate portions, each arranged and operated, so that a ball or other suitable body inserted through an aperture formed in a frame containing one portion of the annunciator and situated in any desired apartment or place and provided with several other like apertures, each properly designated to correspond to the wants required, descends a series of inclined planes or movable levers, and as it approaches the end of each lever or plane brings a metallic pin or stem connected with the bottom of the lever and with one wire of an electrical battery in contact with a metallic plate connected with the other portion of the annunciator and the opposite wire of the battery, or the wire of the stem and plate may be arranged vice-versa, and closes the electrical circuit by which a series of mechanical devices are operated so as to strike a bell and partly revolve a cylinder or drum arranged on its periphery with blanks, names, and numbers to the proper distance required to bring to view the number of the room and the name of the article or person wanted. The plane or lever being released after the passage of the ball or other body, which is finally deposited in a receptacle prepared to receive it, and the electrical circuit opened leaving the cylinder or drum in the position desired, until turned back to its original position by the operation of a series of mechanical devices.

A modification of this portion of this invention consists in a series of stationary inclined planes arranged at opposite angles in a frame, provided with apertures opening on to the upper ends of each plane, and having a metallic stem or pin connected with the side of the interior of the frame, the stem or pin, and spring being suitably connected with the opposite wires of an electrical battery and with the other portion of the annunciator, so that a ball or other body descending from one plane to the other presses the spring against the pin or stem and closes an electrical circuit, by which the cylinder or drum of the annunciator is operated in the same manner as by the former arrangement.

The second portion of these improvements consists in a method of operating the character card, by which the act of summoning a servant or calling for any articles is greatly simplified and rendered more certain.

A series of instruments or devices is to be placed within the case of the annunciator corresponding in number with the number of apartments with which communication is to be established, and all the shields or indicators of one row (as there may be several rows) are to be actuated by one shaft and crank, in order that any given shield after falling and indicating the want of the caller may be "set back" by such crank.

Within each apartment and immediately adjacent to the wire knob is placed a card giving the proper directions for effecting the call, that is to say, directing the caller to press the knob once when he desires waiter, two when he desires cigars, three for coach, &c., and the characters upon the shield are to be arranged in the order begining at the bottom with the instructions within each apartment. If two or more rows of instruments are employed, the cranks of each series are to be mounted upon one shaft or connected in a suitable manner so that the register or display card of any instrument may be set by one crank.

To operate such an apparatus we will suppose that the shield is at its highest point, the armature away om and unobstructed by the magnet, and the electrical circuit with the battery open. A caller desiring a iter, for instance, places his thumb or finger upon the knob and by pressing upon it establishes commu- ation with the battery, and closes electrical circuit with the magnet, which attracts the armature and noves the pallet from below the pin which rests upon it and moves such pallet inward below the next ceeding pin in the opposite series where it remains until the pressure upon the knob is removed when pallet returns to its original position by the opening of the circuit and allows the shield to drop a tance sufficient to bring the word waiter in front of the window and thus indicate to the attendant in the ice the want of the caller; each window of course being numbered to correspond with the number of the om connected with it. If cigars or article No. 2 or whatever it may be is wanted the caller presses the ob twice which effects a second pulsation of the armature and repeats the closing and opening of the ectrical circuit and brings the second character in view through the window and so on throughout the ries of characters.

One battery will suffice to operate a large number of instruments, as the only labor the magnet has to erform is to release the pallet from one of the pins of the escape wheel; as the shield is very light and is nearly counterbalanced, the power required to release the pallet is very slight.

A modification of this mode of signalling would be to employ a number of stops equal to the number of articles designated on the register, and a register card so placed or combined with the stop that each of the latter shall have a name to which it belongs, that is, one stop to water, another to matches, etc., so that a person desiring a given article shall press the knob corresponding to such article.

In this way but one pressure of the knob would be necessary to all for any given article on the register.

In lieu of a shield composed of a cylinder or portion of a cylinder turning upon a horizontal axis the register may be affixed to a flat rotary disc, having the articles arranged in radial lines about it.

The sheet of paper upon which the register or list of articles is pivoted or inscribed, is secured to the shield at each end by turning down upon it the extremity of the shield, which constitutes a cheap and perfectly secure attachment.

I have also combined with this annunciator a device for detecting the presence of fire in any room or apartment with which the register is connected, and this device consists as follows. I attach to any suitable portion of the case, a bulb or vessel composed of glass or any suitable material, and having two cells or chambers, the lower and large one of which is to receive and contain a quantity of quicksilver, and the upper and smaller one being to receive any excess of such quicksilver which the expansion of the latter will force into it, and which would otherwise burst the bulb. The wire from the battery is introduced into the small cell and nearly in contact with the quicksilver in the chamber, or at such a distance that the latter when subjected to a degree of heat of about 100° Fahrenheit shall expand and communicate with the said wire, and thereby close the circuit with the other wire, which conducts to the register, and which enters the quicksilver through the bottom of the chamber.

A character is to be inscribed upon the shield which shall indicate to the clerk in the office or the attendant that danger exists, and a like character is to be inscribed upon the card in each guest's room corresponding to this, in order that attention may be called at once.

A.D. 1874, January 23.—No. 299.

LISTER, SAMUEL CUNLIFFE, of Manningham, in the county of York.—"Improvements in preparing and "combing waste silk and wool, or hair, and in apparatus therefor."

An additional pressing roller is used to act with the concave feed plate of apparatus described in No. 1727 in the year 1866. To prepare some kinds of silk waste it is first steeped in water or soap and water, then dried and prepared upon gills or drums, then rough combed. The jiggings are boiled or further softened, then gilled and again combed. Instead of preparing and drumming waste silk as heretofore, it is proposed only to prepare it. This is accomplished by using fine gills combined with a low draft. It is first prepared on coarse gills, and then through finer and finer ones. The same principle can be applied to preparing various descriptions of waste silk.

In the apparatus described under 4th head of Specification No. 3139 in the year 1872, a nipping plate is placed in the feed comb, so that the long may be separated from the short fibres. After the fringe of fibres from the feed comb has been cleaned, the segment combs are inserted into it, and the fringe is pulled through them a short distance by a nipper before it is taken hold of by the comb and nipper which are to draw it out. A nipper working in this manner can also be used to draw forward the fringe before it is taken off by drawing rollers. A circular comb is also used to partially clean the projecting end before it is cleaned by the card surfaces.

A.D. 1874, January 23.—No. 300.

REW, G. Gale, of Plymouth, in the county of Devon.—" Improvements in syphons."

My invention of improvements in syphons consists in attaching to the highest part or top of the bent pip a small vertical air pump to exhaust the air from the tube and allow the spirit or other liquid to flow freely the long end of the tube is closed by a tap while the air is being exhausted; the tap is also used to regulat or stop the flow of the liquid when desired.

A.D. 1874, January 23.—No. 301.

HACHE, Eugène Henri, of the firm Hache et Cie., of Paris, Boulevard de Strasbourg, No. 23.—(*A co munication from Georges Lévy, a person resident Bd. de Strasbourg, 23, à Paris.*)—" An improved mecha " cal apparatus for indicating by clock-work the excessive pressures of lighting gas."

This apparatus consists of three principal parts: a manometer, a clock movement with a bell put into communication by a balance lever or float.

A.D. 1874, January 23.—No. 302.

DELALOT, Stanislas Louis, of Paris, in the French Republic, but at present of 5, Southampton Buildings, Holborn, in the county of Middlesex.—" Improvements in the manufacture of white metal."

The feature of novelty of this invention consists in manufacturing a white metal, the object of which is to replace those now generally in use at a reduced cost, by means of an alloy of copper, oxide of manganese, zinc, and phosphate of lime in various proportions.

A.D. 1874, January 23.—No. 303.

HOWES, Walter, and **BURLEY**, William, both of Birmingham, in the county of Warwick, lamp manufacturers.—" Improvements in the construction and manufacture of carriage lamps, and in apparatus " employed in the said manufacture, and in connecting carriage lamps to lamp irons."

According to this invention the candle tube of the lamp is connected to a plate or bottom, which by a sliding motion can readily be connected to and disconnected from the fixed bottom of the lamp case. Great facility in trimming the lamp and placing the candle in the candle tube is thereby obtained. The efficient ventilation of the lamp is effected by making exit slots for the hot air in the head of the chimney, the said exit slots being situated around three sides of the base of an inverted pyramidal piece depending in the axis of the chimney. The lamp is connected to the lamp iron by means of a screwed tubular socket on the back of the lamp case being screwed upon the screwed end of the lamp iron, a fixing screw pin preventing the turning of the socket.

The tubular beadings or edgings of the flanges of the lamp chimney, and the parts of the framing of the lamp glasses and like parts are connected together by hard soldering, the abutting ends or parts being bevilled. During the bevelling of the ends of the tubular beadings, they are supported internally and externally in a holder provided with a fixed inclined cutting edge, against which, by the action of an oblique moveable cutter, the edge is cut, whereby a very smooth unpuckered edge is given to the bevilled ends of the tubular beadings and like parts.

A.D. 1874, January 23.—No. 304.

HARRIS, Joseph, of Birmingham, in the county of Warwick, manufacturer, and **JUDSON**, John, of Aston, near Birmingham, aforesaid, manufacturer.—" Improvements in sewing machines."

This invention consists of the following improvements for working the shuttle and feeder of sewing machines. The shuttle is driven by an excentric on the shuttle shaft, the lower end of the connecting rod of the excentric clip being jointed to a bell crank lever, and the latter by a connecting link to the shuttle carrier. The feeder is worked by two cams on the shuttle shaft, one cam giving the rising motion to the feeder, and the other cam giving the reciprocating sliding motion to the feeder. The cam for giving the rising motion acts directly upon that end of the feeder to be raised, while the other cam acts upon the feeder through a forked lever and a pointed arm. One arm of this forked lever is serrated, and the pointed arm described engages with it. By adjusting this pointed arm the length of the feed and stitch can be regulated. A modification is described in which the connecting arm of the notched lever may be made to project from the side of the machine, so that by a thumb plate and graduated scale the length of the feed and stitch can be adjusted with the greatest nicety.

A.D. 1874, January 23.—No. 305.

Y, John, of Birmingham, in the county of Warwick, gentleman, and TURNEY, Frederick
son, of Stourbridge, in the county of Worcester, manager of glue works.—" Improvements in
tus for drying or finishing glue."
ding to this invention a horizontal air tight drying passage, having parallel parts or branches, is
d at one end with the case of an exhaust fan, and at the other end with a hot air stove. The glue
een arranged in the drying passage and the doors closed and fastened, the exhaust fan is worked
ntinuous current of hot air is thereby drawn through or exhausted from the drying passage, and
therein rapidly dried.

A.D. 1874, January 24.—No. 306.

S, John, of Albert Works, West Gorton, in the county of Lancaster, machinist.—" Improvements
hinery for turning and cutting wood, metal, and other materials."
atures of novelty in this invention consist in constructing a machine capable of turning a single article,
r more articles simultaneously by mounting the same between spindles which not only revolve round
n axes in the ordinary manner of a lathe, but also have a slow, rotary motion round a fixed centre,
common to all the spindles. In revolving round this fixed centre, each article, whilst rapidly
g upon its spindles, is brought in contact with a fixed tool or tools arranged at a proper cutting angle
g distances from such centre and from each other, and thus by the time that a complete revolution
indles round such common centre is performed the article is turned to the shape required.

A.D. 1874, January 24.—No. 307.

N, Andrew, of the firm of William Simons and Company, of the town and county of Renfrew,
ritain, engineers and ship builders.—" Improvements in dredgers."
atures of novelty which constitute this invention are,—
Providing the wells of hopper dredgers with doors.
d. The construction of hopper dredgers with propelling and steering apparatus at each end of the

. The employment of hydraulic apparatus for raising and lowering the bucket ladder.

A.D. 1874, January 24.—No. 308.

, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A*
cation from Thomas Schoenberger Blair, of Pittsburg, Pennsylvannia, United States of America.)—
vements in regenerative furnaces."
nvention relates to means of utilising the waste heat of pairs or numbers of furnaces by the use of
tors arranged in such a manner that the flame escaping from one of the furnaces heats the air or
oth the air and the gas supplied to another of the furnaces, whereby complication of structure is

ces may be thus arranged in pairs, back to back, or in greater numbers in a circle or line with their
doors on the exposed sides and regenerative chambers at the ends or at the other sides, each such
being connected to the outlet of the one furnace and to the inlet of the next, so that the flame
from the one heats the supply of the other.

A.D. 1874, January 24.—No. 309.

RHAM, Henry, of Bradford, in the county of York, stuff manufacturer.—" Improvements in the
motion of looms for weaving striped fabrics."
threaded worm wheel is fixed upon the crank shaft of loom at the fly wheel end, this wheel works
nion fixed upon an upright shaft which drives the tappets by means of bevel wheels. The tappets
worked on the top of the frame of the loom, the treddles and connections with healds being all
e warp instead of below as in arrangement hitherto in use.

A.D. 1874, January 24.—No. 310.

ELD, William Horatio, of the Mansion House Buildings, in the city of London.—" Improve-
in capstans and windlasses."
Provisional Specification describes a combined windlass and capstan driven from a steam winch. An

endless chain passes round a chain wheel on the axis of the winch, and around another chain wheel intermediate shaft. Two pinions on this axis work into spur wheels keyed on the axis of the windlas a beveled pinion gears into and drives a similar pinion on the capstan shaft.

A.D. 1874, January 24.—No. 311.

DE LA RUE, Warren William, and **SHAW, William Thomas**, both of 110, Bunhill Row, in th of London.—" Improvements in rotating calenders or date indicators."

This Provisional Specification describes having two concentric discs, one for the months and the oth the days; one disc turns on a hollow axis, through which passes the axis of the other disc.

A.D. 1874, January 24.—No. 312.

GRUBY, James, of Brunswick Place, Brighton, in the county of Sussex.—" Improvements in umb " and parasols."

The feature of novelty of this invention consists in cutting out one or more apertures in one or more of an umbrella or parasol, and affixing thereon a transparent material, so that when held before th against a strong wind and rain the person holding it will see his way, and thus avoid collision.

A.D. 1874, January 24.—No. 313.

BRAKELL, Christopher, of York Street Chambers, Manchester, in the county of Lancaster, eng —" Improvements in apparatus to be applied to looms for weaving velvets and other pile fabrics f " purpose of cutting or forming the pile as the fabrics are being woven; a modification of the sai " provements, without the cutting action, being also applicable for forming the loops or pile in fabrics " nature of brussels carpets or other material which can be made thicker by a loop or pile or corrugatio

The features of novelty which constitute this invention consist in weaving into the races of pile f wires or blades—lengthways of the piece—which are then released as the fabric is being wound roun beam of the loom by a vibrating cross knife or revolving knive or cutter in contact with the wires or b referred to, thereby forming the pile.

Another plan of releasing the said wires or blades and thereby forming the pile is to dispense wit vibrating cross-knife or revolving cutter by letting the wires or blades have a cutting edge, at a certain and giving them a vibrating motion lengthways of the fabric if required.

A modification of the said invention without the cutting action is also applicable for forming the or pile in fabrics of the nature of brussels carpets or other material of a similar nature.

A.D. 1874, January 24.—No. 314.

WHITE, Charles Melbourne, of Lilford Road, Stoke Newington, in the county of Middlesex.—" " provements in tobacco pouches."

The invention consists in constructing a dust proof pouch by forming the mouth or lips longer tha heretofore been proposed, said lips being folded over and fastened in that position when it is desired to the pouch.

A.D. 1874, January 24.—No. 315.

WILLIAMS, William, of Brecon, in the county of Brecknock.—" Improvements in the hanging " arrangement of window sashes and stiles; and in the fixings connected therewith."

The novelty of the invention consists in providing window sashes at their edges opposite the groov which they slide with hanging stiles or strips of wood which fit and slide in such grooves in lieu o sashes themselves, the said sashes being connected to such hanging stiles in a manner that will enable to swivel clear of the beading, and by which also two movements of the said sashes can be obtained, viz up and down movement in the grooves of the window frame through the medium of their conne hanging stiles, and the other a swivel movement upon their connecting pivots with such stiles.

The sashes are provided with tongues or strips of metal which in their normal position when the win are closed are pushed forward or actuated by screw so as to form a water tight barrier at the juncti connection between the edges of the sashes and their hanging stiles.

A.D. 1874, January 24.—No. 316.

CONDIT, Frederic, of Providence, Rhode Island, in the United States of America, but at present residing at Queen's Square, Bloomsbury, in the county of Middlesex.—(*Partly a communication from Edward Pike Chapin, residing at Providence, Rhode Island, in the United States of America.*)—"Improvements in weaving "ribbons and other narrow fabrics, and in looms and apparatus used in connection therewith for the "manufacture of such fabrics."

This invention consists in the use of pieces of paper or other material between the layers of warps for the purpose of making the threads lie smooth, even, and level; in fastening one end of the warp to a piece of cloth placed in connection with the beam or bobbin, so as to enable the whole of the warp to be used without waste; in certain arrangements for winding edge bobbins and warps direct from the spools on which the threads come from the winding engine, and for measuring and indicating the length of thread or warp so wound; in the construction, arrangement, and use of moveable eyes or guides forming the "heck," and of automatic mechanism connected therewith for giving notice when a thread is broken or run out or not in the eye or guide, and for stopping the warping mill; in the construction and arrangement of the eyes of the "heck," and in the combination and arrangement of mechanism in connection therewith, in order to place the same in a small space; and in the combination and arrangement of small harness shafts with the main harness shafts, so as to enable one warp with its harnesses, lease rods, and reed, to be removed from the loom without disturbing any of the other warps or harnesses.

A.D. 1874, January 24.—No. 317.

LUCAS, Ernst Friedrich Richard, of Coatham, Redcar, in the county of York, consulting chemist.—"Improvements in the manufacture of anthracene."

Under this invention, anthracene is obtained from the heavy coal tar oils which distil at from 260° to 360° Celsius, by passing the same or the vapours thereof through pipes or retorts previously raised to a red heat. The heated surface is increased by filling the pipes or retorts with pieces of firebrick. The oil obtained by this operation is submitted to distillation, and the distillate which passes over after 360° Celsius, is collected separately, cooled, and pressed, the press cake thereby obtained being crude anthracene. The liquid oil resulting from this distillation is again passed through red hot pipes or retorts, and another portion of anthracene is obtained therefrom.

A.D. 1874, January 24.—No. 318.

CHIPPINDALE, Isaac, of Potternewton, near Leeds, in the county of York.—"Improvements in the "means or apparatus employed for sifting cinders or ashes."

The cinders or ashes fall on to a riddle or sieve fitted in a box below the grate: the riddle has a rocking motion imparted to it, whereby the small particles pass through into the box below, and the larger are retained on the sieve ready for use.

A.D. 1874, January 24.—No. 319.

SUTHERLAND, George Granville William Sutherland Leveson Gower, Duke of, of Stafford House, in the county of Middlesex.—"Improvements in implements to be used in cultivating waste or "moor land by steam power."

This Provisional Specification describes improvements on a plough described in McLennan's Specification $\frac{3151}{72}$.

A.D. 1874, January 24.—No. 320.

CHUBB, George Hayter, of 57, St. Paul's Church Yard, and **CHALK, William Henry**, of 13, Alpha Street, Peckham Rye.—"Improvements in safes, applicable also in part to strong room doors."

This Provisional Specification describes forming the safe so as to prevent the back and lining from being removed. Means of securing the doors are also described.

A.D. 1874, January 24.—No. 321.

GEBAUER, Frederic, of Charlottenburg, in the Kingdom of Prussia.—"A rotating hydraulic mangle."

The object of this invention is the construction of an improved mangle to be used in the finishing process of cotton, linen, and other woven materials for imparting to the same the lustre requisite for a saleable article as well as to produce watered or tabbied wares. The improved mangle has two rotating cylinders constructed of cast iron or other suitable material. One of these cylinders, by preference the upper one, turns in fixed bearings, whilst the bearings of the other one can be lifted or lowered in proper guides. Both cylinders turn at the same circumferential speed, so that a roller with cloth brought between the two will revolve with them. The pressure amounting to 30 tons or more, as well as the lifting and lowering of the lower cylinder is caused by two hydraulic presses duly connected to the framing of the machine, whilst the pistons of such presses act upon the bearings of the cylinder.

A.D. 1874, January 24.—No. 322.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Eugène Philippe Pelouze and Marie Eugène Paul Audouin, both of Paris, France.*)—"An improved process for eliminating the soluble principles contained in gases and vapors."

According to this invention, as applied in the manufacture of illuminating gas, the soluble principles contained in the gas are dissolved by bringing it into intimate contact with a liquid in the form of fine spray, the liquid being afterwards eliminated in a condensing apparatus.

A.D. 1874, January 24.—No. 323.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Antoine Louis Ligny, of Paris, France.*)—"An improved apparatus for drying and "heating purposes."

This apparatus consists of a rectangular or other shaped fire basket mounted on casters and open on all sides, which are provided with doors for directing the heat on any point, and also with adjustable pipes above for conducting the heat to a distance, as in drying the walls of a room for instance, assisted by a blower.

APPENDIX

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CHRONOLOGICAL AND DESCRIPTIVE INDEX,

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idgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 18 to July 24, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, January 26.—No. 333.

DAMS, JOHN STOWELL, of the city of Boston, in the state of Massachusetts, United States of America. —(*A communication from John Collicatt, a person resident at the said Boston.*)—" Improvements in kaleidoscopes."

In these kaleidoscopes a greater range of blended forms, shapes, colors, and patterns is provided than is found in the ordinary kaleidoscope. A box or case encloses clockwork machinery at one end of the said box a standard is erected which supports an ordinary kaleidoscope-tube, with the opening for the eye at its upper end. Under the kaleidoscope tube is a rotating flat table, circular in shape. This table is highly ornamented, and various discs of all shapes, colors, and designs may be placed upon the same.

A.D. 1874, January 27.—No. 336.

CUNNINGHAM, DAVID, of Stewarton, in the county of Ayr, North Britain, and **DOUGLAS, ALEXANDER**, of Kilmarnock, in the same county, Scotch bonnet manufacturers.—" Improvements in the manufacture of " Scotch or other similar bonnets, caps, or hats."

In carrying out the invention, the fabric to form the bonnet, cap, or hat is woven in a hand or power loom so as to require no subsequent seaming, but so as when each portion is taken from the loom it can be at once submitted to a fulling mill, and be treated and finished like the knitted fabric hitherto generally employed for making such articles. To obtain the woven fabric of the requisite form for a Scotch bonnet it is woven n four plies.

A.D. 1874, January 27.—No. 341.

HILL, HENRY CHEETHAM, of Staleybridge, in the county of Lancaster, cotton spinner.—" Improvements " in machinery for winding yarn and thread."

My invention consists in applying a rail in front of the row of spindles, or in other suitable position, and n fixing to this rail guide plates of steel, the edges of which are left sufficiently apart for the passage of the yarn or thread to the spindle. A to and fro motion along the slits between the guide plates is given to the yarn or thread by means of a rocking bar placed below.

A.D. 1874, January 27.—No. 342.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Eugène Charles Maldant, of Paris, France, civil engineer.* —" An improved " apparatus for maintaining a constant level of water in wet gas-meters, and for separating from vapour " liquid held in suspension in the same."

My said invention has for effects the mechanical separation or condensation of the water contained in the gas as it leaves the meter. This water of condensation, by means of the said improved apparatus, is recovered and caused to return to the meters in such a manner as to prevent or retard the sinking of the normal level of the water; consequently the constancy and exactitude of their measurements will be maintained, and at the same time the cost of their supervision and repairing will be diminished.

A.D. 1874, January 27.—No. 345.

SMITH, George, of Queen's Gate, Hyde Park, in the county of Middlesex, esquire.—"An
" beverage or artificial apollinaris water."

This invention relates to a manufacture of a beverage or artificial apollinaris water. The i
mentioned are bicarbonate, sulphate, and phosphate of soda, chloride of sodium, carbonates of
and lime, also chemical equivalents. The ingredients are pulverized, mixed, and charged with g
agents for aerating.

A.D. 1874, January 28.—No. 359.

WEST, William, of Birmingham, in the county of Warwick, jeweller, and **SPITTLE,**
Frederick, of Birmingham, aforesaid, manager of works.—"Improvements in solitaires, sleeve
" other like dress fastenings."

This invention refers in part to an invention patented by William West one of the applicants, o
of September 1872, No. 2722; and the present improvements consist in making the case or box in
spring bolt of the fastening works as well as the said bolt capable of a sliding motion. By this cc
both the bolt and the box engage with and on opposite sides of the head of the inclined collar c
of the fastening and thus connect the two parts of the fastening together by a double bolting ac
two parts are released by pressing the spring bolt and box in opposite directions so as to simu
withdraw them from the inclined collar.

The improvements described are also applicable to solitaires, sleeve links, and other like fas
which a spring bolt engages with a hooked arm turning on a joint. The joint pin and arm
mentioned fastenings are made from one piece of metal for the purpose of preventing the loss o
pin.

A.D. 1874, January 29.—No. 367.

GERHARD, Frederick William, of Coseley, in the county of Stafford, metallurgical
" Improvements in the purification of iron ores and other compounds containing iron, and in tl
" tion of iron therefrom."

This invention relates to certain improvements upon the subject matter of Letters Patent gra
the said Frederick William Gerhard and James Light, junior, of Bradley, in the county of St
" Improvements in the production of iron and steel," dated 16th day of May, A.D. 1872, No.
consists, firstly, in certain improved means of extracting the sulphur, phosphorus, or other
ingredients; and secondly, in an improved process for manufacturing iron from such purifie
compounds containing iron.

A.D. 1874, January 29.—No. 376.

RICHARDS, James, of Clifton Lodge, near Preston, in the county of Lancaster, chemist.—"
" ments in the manufacture of bicarbonate of soda."

My invention consists in treating bicarbonate of soda by a dilute solution of caustic ammo
decomposes the bicarbonate of ammonia, thus forming carbonate of ammonia which is easily re
washing.

A.D. 1874, January 31.—No. 403.

LUMLEY, Thomas, of Harborne, in the county of Stafford, mechanical engineer.—"Impro
" steam pumps."

This invention consists in working the steam cylinders of steam pumps by arranging at each
steam cylinder a chamber in a small cylinder, in which chamber a valve works for putting the
communication either with the exhaust or with the steam. An opening is made near each end of
cylinder, the opening at one end being in communication with the valve cylinder at the other
steam cylinder. As the piston approaches the end of its stroke, steam is allowed to pass through tl
in the steam cylinder to the valve cylinder at the other end of the steam cylinder, and the va
connects the steam cylinder with the exhaust; at the same time the steam cylinder piston strike
at the same end of the cylinder and opens the steam way. The piston in completing its strol
direction is thus made so to act upon the valves as to change that which was the exhaust side of
into the steam side and the reverse.

A.D. 1874, January 31.—No. 404.

CHERRY, Henry, of Handsworth, in the county of Stafford, mechanical engineer.—" Improvements in " steam pumps."

The inventor places a loaded valve in the suction pipe for the purpose of producing a vacuum into which the exhaust steam is discharged. At the upper part of the condenser is a chamber which first receives the water raised and from which it passes through a loaded valve by which it is spread into a thin sheet and then falls into the condenser. A bell mouth pipe is situated in the axis of the condenser, the lower end of the said pipe leading to the pump. By this arrangement a quantity of water always remains in the condenser which effects the condensation of the steam when the steam pump is first started. Various arrangements are described for pressing the loaded valve to its seat.

The suction valves of steam pumps having condensers are made of thin sheet metal dished or turned up at the rim, the extreme edge being turned down to form a lip. The valve seat is ribbed. A light valve capable of opening readily and of being rapidly closed by the action of a spring is thereto formed.

A.D. 1874, February 2.—No. 415.

MARCHANT, John, of No. 10, Dagmar Road, Camberwell, in the county of Surrey.—" Improvements in " guard or safety signals for railway points or switches."

This invention relates to means of signalling to a pointsman the passage of a train over points distant from or invisible to him, so as to forbid his shifting the points while the train is passing over them.

A counterweighted or spring trigger or slide is mounted close to the points so as to be acted on by passing wheels causing it to make and break contact with an electric wire leading to a visible or audible electric signal in the signal box. The action of this signal informs the pointsman in the box that the train is passing the points, and he is thus warned against moving the points till the action of the signal ceases, the last wheel of the train having passed it.

A.D. 1874, February 3.—No. 434.

LEONARDT, Friedrich, of Birmingham, in the county of Warwick, manufacturer, and GILBERT, William, of Birmingham aforesaid, stamper and piercer.—" Improvements in boxes or receptacles for " holding pens, buttons, needles, and other small articles, and for other purposes."

One part of this invention consists in combining with boxes or receptacles for holding pens, buttons, and other articles, means for exhibiting a sample or pattern of the articles contained in the box. For this purpose a small chamber is either hinged or fixed to the end, side, or top or lid of the box, in which chamber the pattern pen or button is placed. The pattern is seen through the glass front of the chamber, and the said pattern is protected from dust and the action of the atmosphere. Or the same object is attained by making the closed end of the case in which the box slides of glass, and affixing the pattern pen or article to the end of the box.

Another part consists in making metallic boxes or receptacles capable of being readily moved on a table or other surface. To this end the box or receptacle has the general figure of a wheelbarrow, and is either open at top or closed by a hinged plate or case.

The body of the box is made from one piece of sheet metal and the sides from separate pieces, the parts being connected together by ears passed through piercings and clinched.

The case, which may be jointed to the top of the box, may be used for holding needles and other small articles.

A.D. 1874, April 23.—No. 1421.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Edward Brown, of Philadelphia, United States of America.*)—" Improvements in machinery or apparatus for indicating the number of revolutions per minute made by a rotating " shaft."

My invention consists, 1st, in combining a wheel rotating at regular intervals by clock movement with two sets of counting registers. The friction wheel or ratchet which actuates the registers is transferred by a suitable escapement (connected to the clock wheel) alternately from one counting register to the other. The registers alternately reset themselves to 0 or zero at the end of each minute, second. In accomplishing the purpose by the rotation of mercury in a cup having projecting arms, the alteration in the level of the mercury due to centrifugal force is shown by a column of colored water in a glass tube above the cup. A modification of the same invention is also shown, in which the rotating arms are elevated and rotate around the glass tube, so that a column of mercury can be used in the glass tube.

A.D. 1874, July 20.—No. 2536.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Celestin Martin, a person resident at Verviers, in the Kingdom of Belgium.*)—" Certain new and useful improvement in machines for spinning wool, cotton, silk, and fibrous material in general."

This invention consists in applying to the fixed spinning machines, grooved cylinders for the purpose of preventing the too great twisting of the threads.

A.D. 1874, July 22.—No. 2560.

DAVIS, Jacob W., and STRAUSS, Levi, of the city and county of San Francisco, State of California, in the United States of America.—" Improvements in fastening the corners of pockets in wearing apparel in order to prevent them from tearing or the seam from ripping."

This invention relates to a fastening for pocket openings, whereby the sewed seams are prevented from ripping or starting from frequent pressure or strain thereon; and it consists in the employment of a metal rivet or eyelet at each edge of the pocket opening, to prevent the ripping of the seam at those points.

The rivet or eyelet is so fastened in the seam as to bind the two parts of cloth which the seam unites together, so that it shall prevent the strain or pressure from coming upon the thread with which the seam is sewed.

A.D. 1874, July 22.—No. 2563.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Atkinson, of Gardner, in the county of Grundy, and state of Illinois, United States of America.*)—" Improvements in steam pumps."

The invention consists in the combination with a main cylinder having steam ports and a piston rod carrying a middle piston and two pistons of cylinders placed at opposite ends of main cylinder, having respectively water inlet and outlet, and connected by a channel way, a continuous flow of water at the exit being produced.

The invention also consists in the arrangement of the valves in the ends of the steam chest for convenience of access.

A.D. 1874, July 22.—No. 2566.

MOULY, Francois Victor, of Leicester Square, in the county of Middlesex, engineer.—" Improvements in apparatus for heating and ventilating dwelling houses and other buildings."

Novel stove for heating air and water; single chimney and ventilating flue; new ventilating chimney cowl.

A.D. 1874, July 23.—No. 2581.

MONCKTON, Edward Henry Cradock, of Fineshade, Northamptonshire.—" Improvements in pulping, drying, and converting peat into fuel and other useful products, and in the apparatus and methods necessary for effecting and applying the same."

1. Various sorts of peat or bog muck are prepared, as dried charcoal, ashes, liquor, and otherwise by the means of novel pulping machines, triturators, and strainers, and by means of compression with or without the addition of an exhaust, also by means of novel kilns and apparatus for drying by the introduction of hot air and superheated steam, as set forth and detailed.

2. The products so obtained are applied by the various novel methods detailed to a variety of useful purposes, such as for fuel, for preserving fish, meat, hides, and animal and other matters generally; for tanning, deodorising closets, pans, stables, urinals, and drains, the manufacture of manures, and the purification of water, spirits, oils, syrups, and other impure liquids.

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Cain, T., 86, Hollow fire-bars.
Cambon & Co. (Johnson), 18, Preserving textile fabrics,
[wood, &c.
Camp, A. van, & Clark, G., 33, Pavements.
Cannon, T., 330 (*App.* 3.) Glue.
Capon, L. J. B. (Lacaze), 287, Looms.
Casement, D. T. (Clark), 69, Combustion of fuel and
[generation of steam.
——— (Clark), 70, Regulating pressure of fluids.
Chalk, W. H., & Chubb, G. H., 320, Safes and strong
[room doors.
Chalumet, G. (Mewburn), 156, Textile fabrics.
Chamberlin, W. R. B., 54, Electro-motive-power.
Chandler, S., & Hulett, D., 1287 (*App.* 42.) Gas.
Chapin, E. P. (Condit), 316, Weaving ribbons, &c.
Chapman, G., 38, Sesqui-carbonate of ammonia.
Cherry, H., 404 (*App.* 4.) Steam pumps.
Chippindale, I., 318, Sifting cinders.
Chubb, G. H. & Chalk, W. H., 320, Safes and strong
[room doors.
Clark, A. M. (*Casement*), 69, Combustion of fuel and
[generation of steam.
——— (*Casement*), 70, Regulating pressure of fluids.
——— (*Rogers*), 208, Lamp black.
——— (*Sawyer*), 253, Electric telegraphs.
——— (*Morton*), 290, Propelling vessels.
——— (*La Grove*), 292, Mechanical toy.
——— (*Pelouze & Audouin*), 322, Gas-purifying.
——— (*Ligny*), 323, Drying and heating.
Clark (*Allin*), 350 (*App.* 31) Cutting and screwi
[pip
——— (*Tracy & Lawton*), 363 (*App.* 31.) Sewing-m
[chine cabine
——— (*Gschwind & Beberdick*), 421 (*App.* 32.) Mouldin
——— (*McKinley*), 438 (*App.* 32.) Hoeing, &c.
——— (*Davies*), 952 (*App.* 38.) Signal lanterns.
——— (*Cook*), 1019 (*App.* 39.) Preparing grain for flo
——— (*Doremus*), 1410 (*App.* 43.) Springs.
——— (*Bliss*), 2366 (*App.* 2.) Making soap bubbles.
——— (*Universal Signal Light Co.*), 2390 (*App.*
[Signal lanter
——— (*Miltimore, Phillips & Morris*) 2498 (*App.*
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——— (*Atkinson*), 2563 (*App.* 4.) Steam pumps.
——— E. P., 49, Teaching military drill.
——— G., & Van Camp, A., 33, Pavements.
——— J., 204, Waterproof garments.
——— J. L., & Standfield, J., 111, Floating docks a
[pontoo
——— J. L., & Standfield, J., 202, Floating docks a
[pontoon
——— W. (*Lo Forte & Quintaralle*) 593 (*App.* 34.) Shi
Clarke, H., 818 (*App.* 36.) Combination locks.
Cluderay, T., 2372 (*App.* 2.) Separating stony substanc
[from foreign beans and whe
Cockerham, H., 309, Stripe motion of looms.
Cockings, J. S. (*Reynolds*), 154, Snap or portable co
[nector
Cohné, S., 37, Composition for bearings.
Cohrs, J. H., 142, Railway couplings.
Cole, F., 181, Crushing and reducing baryta, cocoa, &c.
Collicott, J. (Adams), 333 (*App.* 4.) Kaleidoscopes.
Collicott, J., 2476 (*App.* 3.) Tube scrapers.
Condit, F. (*Chapin*), 316, Weaving ribbons, &c.
Conklin, G. (Lippincott), 237, Condensed milk.
Cook, O. F. (Clark), 1019 (*App.* 39.) Preparing gra
[for flou
Cope, E., & Maxwell, J. R. (Benson), 1086 (*App.* 40
[Steam-engin
Copping, R., & Walworth, J., 2067 (*App.* 51.) Preparin
[wheat for grindin
Corkran, J. F. (*Archbald*), 87, Manures.
Cornely, E. (Gedge), 107, Embroidering machines.
Corpe, C. W., 141, Construction of concrete buildings.
Cotter, W., 1, Combined folding bedstead and air bed.
Cottingham, G. W. (Lake), 1730 (*App.* 46.) Ironin
[machin
Cox, W., 115, Sacks or bags.
Crosland, J. S., 151, Economizing fuel, &c. in furnace
Crosskill, T. A., & Marshall, W., 118, Wringing a
[manglin
Crowell, J. H. (Haseltine), 2291 (*App.* 1.) Weave
[harne
Cruickshank, A. B., 89, Cleats for sailing boats.
Cunningham, D. & Douglas, A., 336 (*App.* 4.), Scot
[or other bonnets, caps or ha
Curtis, F. (*Williams & Page*), 24, Lamps.

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Daddow, S. H., 1558 (*App.* 45.) Fuses for mining a
[blastin
Daimler, G. W. (Abel), 605 (*App.* 50.) Gas mot
[engin
Danet, G. A., & Feuillant, X. C. E., 1007 (*App.* 3
[Preserving fo
David, A. (Ray), 100, Producing optical illusions.
Davies, D., 88, Steam-boilers.
——— 104, Governors of steam-engines.
Davies, T. A. (Clark), 952 (*App.* 38.) Signal lante

Davis, J. W., & Strauss, L., 2560 (*App.* 4.), Fastening [pockets in wearing-apparel.

Dawson, T. G., & J., 1845 (*App.* 48.) Printing.

——— J., & T. G., 1845 (*App.* 48.) Printing.

De Fever, C., 209, Sowing and planting.

De Fresne, E. L. J. E. (Bousfield), 2388 (*App.* 2.) Pro-[pelling ships.

De la Rue, W. W., & Shaw, W. T., 311, Date indicators.

De Mestre, A. (Bonneville), 683 (*App.* 35.) Wiring [bottles.

De Vogt, H. C., 81, Navigating the air.

De Weerd, R. van, 245, Producing motive power.

De Zaccato, E., 1078 (*App.* 40.) Producing fac-similes [of writings, &c.

Deacon, H., 163, Treating impregnated porous sub-[stances employed in effecting chemical [decomposition of gases.

Dean, S., Smith, W. H., & Merrell, H. (Haseltine), 2001 [(*App.* 50.) Dressing millstones.

Deiss, A. A., 147, Extracting quinine from bark.

Delalot, S. L., 302, White metal.

Delavigne, N. A., 56, Corkscrews.

Deny, L., 16, Perforating metal plates.

Derry, J. D., 135, Lamp and candle holders.

Devlan, P. S. (Bonneville), 767 (*App.* 36.) Packing [journal boxes.

Dobson, James & John (Barlow), 11, Carding wool.

—— *John & James* (Barlow), 11, Carding wool.

Donisthorpe, A. R. & G. E., White, G., & Toon, J., 171, [Making woollen yarns.

——— G. E. & A. R., White, G., & Toon, J., 171, [Making woollen yarns.

Doremus, W. T. (Clark), 1410 (*App.* 43.) Springs.

Douglas, A., & Cunningham, D., 336 (*App.* 4.), Scotch [or other bonnets, caps or hats.

Drechsler, F. J., 133, Winnowing machines.

Dubois, E. A. (Vaughan), 246, Air-gas.

Duckett, G., & Mercer, T., 4, Size.

Dudgeon, A., 20, Utilizing heat of furnaces.

——— 22, Peat-fuel.

Dunning, G., & George, C. B. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.

Dutton, S. T., 230, Railway points.

Duval, J. (Jensen), 13, Fire-arms.

Dyk, H. van, 199, Dressing and travelling bags.

Dyson, G. W., 122, Rolling metals, &c.

E.

Easton, W., & Tattersall, F., 248, Moulding bricks, &c.

Eastwood, D., 186, Looms for weaving.

Edwards, S., & Erichsen, E. J. (Jensen), 138, Vats, [gas-holders, &c.

Ellis, J. E., & Redgate, E., 172, Treating hides and skins.

Emsley, S., & Peel, J., 47, Looms for weaving.

Emslie, J. T., 40, Registering passengers in omni-[buses, &c.

Enoult, A., fils, & Varinet, J. (Abel), 184, Dressing [fabrics.

Erichsen E. J., & Edwards, S. (Jensen), 138, Vats, [gas-holders, &c.

Eyre, G., 164, Convertible school desks and seats.

F.

Fallows, J. T., Marlow, J. B., & Roebuck, J., 274, Rail-[way points.

Fanning, J., & Nugent, E., 191, Screws.

Farquhar, J. F. C., 112, Gas burners.

Feuillant, X. C. E., & Danet, G. A., 1007 (*App.* 39.) [Preserving food.

Fever, C. de, 209, Sowing and planting.

Finger, L., 298, Electro-magnetic annunciators.

——— 1779 (*App.* 47.) Electro-magnetic annunciators.

Fitzgerald, D. G., & Molloy, B. C., 266, White lead.

Fleming, G. S., 120, Apparatus applicable to candles [when burning.

Floyd, J. R. (Lake), 679 (*App.* 35.) Gas-retort joints.

Forbes, G. H., 26, Gas making.

——— 28, Fuel.

——— 34, Cements, plaster and artificial fuel.

——— 231, Purifying gas; artificial fuel.

——— 232, Purifying gas.

Ford, A., 269, Cleansing cotton waste.

Forges & Foundries Co. (Browne), 220, Converting iron [scraps into steel.

Forte, R. Lo, & Quintaralle, R. (Clark), 593 (*App.* 34.) [Ships.

Foster, J., & Whitaker, W., 143, Cleaning and smooth-[ing the "dents" of reeds of looms.

Fottrell, J., 77, Artificial stone pipes and tubes.

Foulis, W., 153, Charging retorts.

Foundries & Forges Co. (Browne), 220, Converting iron [scraps into steel.

Fowlie, J. F., 2, Harness.

Fox, F. W., 82, Combing fibres.

—— T., 257, Spring mattresses.

Fresne, E. L. J. E. de (Bousfield), 2388 (*App.* 2.) Pro-[pelling ships.

Fulton, J., & Brown, D. (Haseltine), 1054 (*App.* 39.) [Sheep shears.

G.

Gaillard, L. J. P. E. (Tonaillon), 519 (*App.* 33.) [Stopping teeth.

Gardner, C. F., & Pocock, E. (Morgan-Brown), 450 [(*App.* 49.) Boots.

Gaylord, E. (Henderson), 2110 (*App.* 51.) Fire-arms.

Gebauer, F., 321, Hydraulic mangles.

Gedge, W. E. (*Bradley Window Co.*), 91, Ventilating [window sash.

—— (*Cornely*), 107, Embroidering machines.

—— (*Renard, fils.*), 130, Steam generators.

—— (*Liotard, jun.*), 242, Gas burners.

George, C. B., & Dunning, G. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.

Gerhard, F. W., 367 (*App.* 4.) Purifying iron ores.

Gibbs, W. A., 50, Drying apparatus.

Gibson, H. W., & Sons (Jensen), 273, Wood working [machinery.

Gilbee, W. A. (*Boëthius*), 354, Cork-cutting machinery.

Gilbert, W., & Leonardt, F., 434 (*App.* 4.), Pen and [other boxes.

Gilles, F. G. (Gottheil), 25, Gas engines.

Gottheil, R. (*Oesten*), 6, Measuring heat of fluids in pipes.

——— (*Mehl*), 21, Treating wool.

——— (*Gilles*), 25, Gas engines.

——— (*Lemmens*), 36, Dyeing warps.

Gower, G. G. W. Sutherland-Levison- (Duke of Suther-[land), 319, Steam cultivators.

Green, H. T., & Price, C. W., 29, Railway breaks.

Greener, H., 268, Glass letters and figures.

Greenwood, J., & Pooley, H., jun., 126, Weighing ma-[chines.

Griffin, J. T. (*Austin*), 219, Wrenches.

Griffin, R. A. (Lake), 212, Peat-fuel.

Griffin, T., 271, Coupling for driving belts.

Griscom, S. E., & Larer, D. (Haseltine), 1129 (*App.* 40.) [Dressing millstones.

Grove, W. A. P. la (Clark), 292, Mechanical toy.

Groves, F., & Bramall, S., 83, Railway breaks.

Grubinski, F., 281, Mowing machines.
Gruby, J., 312, Umbrellas and parasols.
Gschwind, J., & Beberdick, C. (Clark), 421 (*App.* 32.) [Mouldings.
Gurr, J., & Williams, D., 103, Anchors.
Gutteridge, F., & Siddall, J., 243, Oil lamps.

H.

Hache, E. H. (*Lévy*), 301, Gas pressure indicator.
Hamer, W., Bond, J., & Threlfall, R. A., 30, Polishing [flulted rollers used in spinning, &c.
Hamilton, J. B., 119, Musical instruments.
Harfield, W. H., 310, Capstans and windlasses.
Harling, W., & Whiteley, W., 244, Looms for weaving.
Harper, J., 951 (*App.* 38.) Steam and air-engines.
Harrington, J., 44, Locks or fastenings.
——— 71, Treating skins or hides.
Harris, J., & Judson, J., 304, Sewing machines.
Harrison, T. W., & Richardson, A. P. (Haseltine), 1109 [(*App.* 40.) Looms.
Hart, W. (Johnson), 358 (*App.* 2.) Self-braking lower- [ing and hoisting apparatus.
Hartley, J., & Rawsthorne, S., 62, Sizing yarns.
——— O. H., & Smith, J. H., 188, Self-acting mules.
Hartmann, G. H. J. & W., 229, Locking and unlocking [railway carriage doors.
——— W. & G. H. J., 229, Locking and unlocking [railway carriage doors.
Harvey, J. F., 258, Umbrellas, &c.
Haseltine, G. (*Jones & Pauly*), 35, Steam-engines.
——— (*Thurston*) 96, Testing strength, &c. of wood [and iron.
——— (*Beckwith*), 474 (*App.* 32.) Sewing-machines.
——— (*McGhee & Risher*), 807 (*App.* 36.) Steam- [engines.
——— (*Hopper*), 815 (*App.* 36.) Dry gas-meters.
——— (*Meaker*), 937 (*App.* 38.) Hoistway doors.
——— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep [shears.
——— (*Harrison & Richardson*), 1109 (*App.* 40.) [Looms.
——— (*Larer & Griscom*), 1129 (*App.* 40.) Dressing [millstones.
——— (*Smith*), 1219 (*App.* 41.) "Buttereine."
——— (*Read*), 1223 (*App.* 41.) Water-meters.
——— (*Isbell*), 1632 (*App.* 45.) Buttons.
——— (*Higley*), 1936 (*App.* 49.) Railway trucks and [axle-boxes.
——— (*Dean, Smith, & Merrell*), 2001 (*App.* 50.) [Dressing millstones.
——— (*Thompson*), 2108 (*App.* 51.) Sewing machines.
——— (*Brayton*), 2209 (*App.* 52.) Gas-engines.
——— (*Walsh*), 2288 (*App.* 1.) Syringing bottles.
——— (*Baker*), 2289 (*App.* 1.) Scoop and sifter.
——— (*Crowell*), 2291 (*App.* 1.) Weavers' harness.
——— (*Bate*), 2352 (*App.* 2.) Refrigerating apparatus.
——— (*Dunning & George*), 2475 (*App.* 3.) Horse- [shoes.
——— (*Rabbeth*), 2497 (*App.* 3.) Spinning machine [spindles and bolsters.
Hearson, C. E., 167, Argand burners for gas and oils.
Heaton, C., 189, Emery and other grinding machines.
Heaton, D. (Bousfield), 2194 (*App.* 52.) Buttons.
Hedley, G. H. C., 123, Fire lighters.
Henderson, A. C. (*Gaylord*), 2110 (*App.* 51.) Fire-arms.
Hennuy, E. J., 703 (*App.* 35.) Water-alarm.
Hepworth, S. S., & Paulding, G., 1798 (*App.* 47.) Cen- [trifugal machines.
Heywood, J. S. C., 216, Compositions for protecting the [surfaces of ships, &c.
Hickisson, J., 279, Stoppering bottles, jars, &c.
Higgins, C. S., & W. B., & Burns, J. (Bonneville), 127 [(*App.* 42.) Watercloset
——— *W. B. & C. S. & Burns, J.* (Bonneville), 127 [(*App.* 42.) Water-closet
Higginson, A., 42, Governors.
Higley, A. (Haseltine), 1936 (*App.* 49.) Railway truc [and axle-box
Hill, D., & Black, W., 173, Soda.
——— H. C., 341 (*App.* 4.) Winding yarn and thread.
Holden, J. & J. E., 114, Washing wool.
——— J. E. & J., 114, Washing wool.
Holmes, F., 68, Polishing stone, &c.
Hooker, W. D., 203, Steam-engines and pumps.
Hopper, T. C. (Haseltine), 815 (*App.* 36.) Dry gas [meters.
Howard, J., & Bousfield, E. T., 178, Steam cultivating [machinery.
Howes, W., & Burley, W., 303, Carriage lamps.
Huerne, P., 207, Self-cleaning water filters.
Hughes, E. T. (*Libotte*), 157, Safety cages for mines, &c.
Hulett, D., & Chandler, S., 1287 (*App.* 42.) Gas.
Hunter, A. G., 907 (*App.* 49.) Carburetting air.
Huntington, F. A., Miller, W. J., & Swingle, A., 1141 [(*App.* 40.) Fire-arms.

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Imhof, D., 182, Musical instruments.
Imray, J. (*Blair*), 308, Regenerative furnaces.
Ireland, A. (Johnson), 215, Wooden rollers for spin- [ning, &c.
Isbell, R. H. (*Haseltine*), 1632 (*App.* 45.) Buttons.

J.

Jaehne, E. (Abel), 1610 (*App.* 45.) Buildings.
Jensen, P. (*Duval*), 13, Fire-arms.
——— (*Erichsen & Edwards*), 138, Vats, gas-holders, &c.
——— (*Gibson & Sons*), 273, Wood working machinery.
Johnson, J. C., 76, Twist lace machines.
——— J. H. (*Nes*), 10, Steel.
——— (*Cambon & Co.*), 18, Preserving textile fabrics, [wood, &c.
——— (*Mousseron*), 73, Warming railway carriages.
——— (*Lamarre*), 214, Compositions for signalling [and illuminating.
——— (*Ireland*), 215, Wooden rollers for spinning, [&c.
——— (*Pollok*), 247, Shoe tips.
——— (*Hart*), 358 (*App.* 2.) Self-braking lowering [and hoisting machines.
——— (*Kolbe*), 595 (*App.* 34.) Acids.
——— (*Winans*), 893 (*App.* 37.) Organ stops.
——— (*Peckham*), 1858 (*App.* 48.) Iron and steel.
——— (*Thorp*), 2100 (*App.* 51.) Cooking, lighting, &c.
——— S. H., 19, Sulphur.
Jones, D., 1429 (*App.* 43.) Lubricating valves an [cylinde
——— E., 194, Cartridge cases.
Jones, T. L., & Pauly, A. (Haseltine), 35, Steam-engin
Judson, J., & Harris, J., 304, Sewing-machines.

K.

Kendall, J. L. (Lake), 701 (*App.* 35.) Floor coverings
Keniston, C. (Morgan-Brown), 5, Boot and shoe fasten- [ings

L., 860 (*App.* 37.) Gripping tools, punches,
[&c.
, 65, Supplying brushes with powder.
Seydeler, G., 149, Measuring distances
[traversed by vehicles.
& J. T., 259, Smoking and fumigating.
& E. C., 259, Smoking and fumigating.
96, Treating and separating ores.
, Shuttle tips.
53, Preventing incrustation in boilers.
(Browne), 66, Raising sunken vessels.
hnson), 595 (*App.* 34.) Acids.
1058 (*App.* 39.) Crushing and separating
[ores.
aughan), 1628 (*App.* 45.) Metallic bear-
[ings.

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A. P. (Clark), 292, Mechanical toy.
. de, & Shaw, W. T., 311, Date indicators.
apon), 287, Looms.
W., & R., 754 (*App.* 36.) Corrugating
[cylinders.
App. 36.) Centrifugal draining machines.
& H. W., 754 (*App.* 36.) Corrugating
[cylinders.
App. 36.) Centrifugal draining machines.
Regulating draught in steam generators.
Allen), 80, Adjustable pulleys.
), 212, Peat-fuel.
), 233, Ventilating and warming.
on), 261, Lamps.
d & Seaman), 278, Sheet metal pails,
[cotton cans, &c.
t), 342 (*App.* 4.) Wet gas meters.
, 679 (*App.* 35) Gas-retort joints.
), 701 (*App.* 35.) Floor coverings.
), 1421 (*App.* 4.) Rotating shaft indicators.
ham), 1730 (*App.* 46.) Ironing machines.
A. A. (Johnson), 214, Compositions for
[signalling and illuminating.
Bonneville), 110, Coal pit wagons.
Gas making.
6, Waterclosets and cisterns.
46, Horse-shoes.
32, Supplying fuel to furnaces.
riscom, S. E. (Haseltine), 1129 (*App.* 40.)
[Dressing millstones.
, *& Tracy, H. R.* (Clark), 363 (*App.* 31.)
[Sewing machine cabinets.
13, Umbrellas, parasols and sunshades.
3, Hydraulic motive-power engines.
, Horse-shoes.
. (Lake), 261, Lamps.
Gottheil), 36, Dyeing warps.
, 67, Holding chain cables.
re escapes.
& Gilbert, W., 434 (*App.* 4.) Pen and
[other boxes.
J. (Murdoch), 97, Obtaining potash.
, G. G. W. Sutherland- (Duke of Suther-
[land), 319, Steam cultivators.
he), 301, Gas pressure indicator.
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252, Trucks or barrows.
Wood, G., 180, Stoves or ranges.
ghes), 157, Safety cages for mines, &c.
W., 523 (*App.* 52.) Lamps.
17, Lamps.
A., 523 (*App.* 52.) Lamps.
iversal Signal (Clark), 2390 (*App.* 2.)
[Signal lanterns.

Ligny, A. L. (Clark), 323, Drying and heating.
Liotard, C. L., jun. (Gedge), 242, Gas burners.
Lippincott, C. A. (*Conklin*), 237, Condensed milk.
Lister, S. C., 280, Combustion of fuel, &c.
—— S. C., 299, Combing waste silk, &c.
Lo Forte, R., & Quintaralle, R. (Clark), 593 (*App.* 34.)
[Ships.
Lockwood, P. E., 289, Treating beer, ale, &c.
Loewensohn, J., 162, Packing-case screws.
Lomax, H., & Bradbury, G. F., 263, Sewing-machines.
Lord, E., 146, Sizing and drying yarn.
Lothrop, H. O., 1780 (*App.* 47.) Ferrules.
Lowry, G., 217, Governors.
Lucas, E. F. R., 317, Anthracene.
Lumley, T.. 403 (*App.* 4.) Steam pumps.

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Macgeorge, W., & McNeil, J., 51, Water tubes for boilers.
McGhee, J. H., & Risher, T. A. (Haseltine), 807
[(*App.* 36.) Steam-engines.
McInnes, J., & Steel, J., 74, Railway breaks and signals.
Macintosh, J., 234, Cigarettes.
Mackenzie, G. N., Brocchus, P. E., Morris, G. W., &
[*Robinson, J. S.* (Benson), 64, Metallurgi-
[cal furnaces.
McKinley, R. (Clark), 438 (*App.* 32.) Hoeing, &c.
McMillan, D., 150, Cleaning machinery belts.
Macmillan, N., sen., 240, Finishing woven fabrics.
Macnab, W., 127, Steam-boilers.
McNeil, J., & Macgeorge, W., 51, Water tubes for boilers.
Maigron, F., 1822 (*App.* 48.) Spinning, doubling and
[twisting.
Maldant, E. C. (Lake), 342 (*App.* 4.) Wet gas meters.
Manley, W. R. (Bousfield), 58, Rotary engines and pumps.
Mansley, J., 78, Compound engines.
Manson, W., 1603 (*App.* 45.) Pneumatic hammers,
[stamps, &c.
Marchand, H. E. (Bonneville), 1170 (*App.* 41.) Rail-
[way breaks and couplings.
Marchant, J., 415, (*App.* 4.) Safety signals for railway
[points.
Marlow, J. B., Roebuck, J., & Fallows, J. T., 274, Rail-
[way points.
Marshall, J., 85, Thrashing machines.
—— W., & Crosskill, T. A., 118, Wringing and
[mangling.
Martin, C. (Bonneville), 2536 (*App.* 4.) Spinning fibrous
[materials.
Martin, S. B., 936 (*App.* 38.) Ice-making, &c.
Mason, T., 99, Mounting and fastening stereotype plates.
Mathieson, J., 238, Torpedoes.
Maw, A., 264, Moulding plastic materials.
Maxwell, J. R., & Cope, E. (Benson), 1086 (*App.* 40.)
[Steam-engines.
Maynes, J., 306, Turning and cutting wood, metal, &c.
Meaker, J. W. (Haseltine), 937 (*App.* 38.) Hoistway
[doors.
Mehl, E. (Gottheil), 21, Treating wool.
Mellard, J., Sykes, J., & Bateman, T. S., 145, Rolling
[metals.
Mercer, T., & Duckett, G., 4, Size.
Merrell, H., Dean, S., & Smith, W. H. (Haseltine), 2001
[(*App.* 50.) Dressing millstones.
Mestre, A. de (Bonneville), 683 (*App.* 35.) Wiring
[bottles.
Mewburn, J. C. (*Chalumet*), 156, Textile fabrics.
Michéa, P. P. F., 284, Tannin and canocarpine.
Miller, J., 241, Glue.
—— J. A. (*Brown*), 98, Rendering, purifying and
[bleaching fatty matters.

Miller, W. J., Swingle, A., & Huntington, F. A., 1141
[(*App.* 40.) Fire-arms.
Miltimore, G. W., Phillips, M., & Morris, R. H. (Clark),
[2498 (*App.* 3.) Railway carriage axles.
Mohr, C., 152, Rivetting joints and seams of boxes, &c.
Moison, T., 196, Drying textile materials, &c.
Molloy, B. C., & Fitzgerald, D. G., 266, White lead.
Molyneux, E., 61, Extracting tea.
Munckton, E. H. C., 265, Magnetic engines; producing
[motive power.
——— E. H. C., 2581 (*App.* 4.) Peat-fuel, &c.
Morgan-Brown, W. (*Gardner & Pocock*), 450 (*App.* 49.)
[Boots.
——— (*Keniston*), 5, Boot and shoe fastenings.
Morrill, J., 267, Pinch bars.
Morris, G. W., Robinson, J. S., Mackenzie, G. N., &
[*Brocchus, P. E.* (Benson), 64, Metallurgical
[furnaces.
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3. Appendix to Chronological and Descriptive Index, containing the Abridgments open to public inspection before the expiration of the term of six months, and also the Abridgments of Complete Specifications received from July 18 to July 24, 1874.
4. Index of Names to Chronological and Descriptive Index from January 1 to January 24, 1874, and to Appendixes from January 25 to July 24, 1874.
5. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 24, 1874, and to Appendixes from January 25 to July 24, 1874.

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CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 25 to January 31, 1874.

A.D. 1874, January 26.—No. 324.

MUZZARELLI, Antonio, of No. 82, Boulevart, Sébastopol, in the city of Paris, merchant.—"An "improved process of bleaching animal glue of all kinds."

This invention relates more especially to glues made from rabbit-skins for use in dressing white tissues.

When the glue is prepared and decanted into tubs, a solution of sulphate of soda is poured into the moulds and mixed with a spatula so as to make a uniform mixture; a solution of acetate of lead is then added, which produces a fine precipitate of sulphate of lead; it is then allowed to cool, and the whiteness of the jelly will be proportionate to the admixture of the sulphate or acetate.

The glue thus bleached and destined for desiccation is then cut up and dried in the usual manner.

A.D. 1874, January 26.—No. 325.

RAMSDEN, John Carter, of Smith House, Lightcliffe, in the county of York, silk manufacturer.—"Improvements in machinery for spinning, doubling, or twisting wool, silk, cotton, flax, or other fibres."

This relates to improved means and apparatus for imparting the necessary rotation to the spindles of such machinery.

I employ a horizontal driving strap, the edge of such strap being received within the groove of the wharles or a portion of the width of such strap may run over flanges or discs placed on the spindles.

A.D. 1874, January 26.—No. 326.

LOWE, Edwin, of Birmingham, in the county of Warwick, coal dealer.—"An improved composition or "material to be used in lieu of coal for fuel."

I propose to collect the dry sewage of the streets or ashpits, or other equivalent accumulations of dry matter, and having driven out any remaining moisture therein to grind it in a mill or by other suitable means to a proper degree of fineness.

I then mix with the said dry matter a proper proportion of (1) gas tar, (2) charcoal, (3) coal slack, (4) clay washings; and the whole being well mixed together is then compressed into moulds of a suitable size and then dried and allowed to acquire a hard consistency, when it is ready for use as fuel.

The improved fuel as thus produced can be used for any purpose where fuel is required; thus, it may be employed either for blast furnaces or for domestic use, being equally serviceable in either case, but the relative proportions of the ingredients to be mixed with the dry sewage matter is altered as required to suit the draught or fire where the material is destined to be employed.

A.D. 1874, January 26.—No. 327.

BUDENBERG, Arnold, of the city of Manchester, engineer.—(*A communication from Bernhard August Schäffer and Christian Frederick Budenberg, of Buckau-Magdeburg, in the Empire of Germany.*)—"Improvements in injectors for raising and forcing fluids."

The features of novelty in this invention consist in arranging the three nozzles at suitable distances from each other, and securing them in such stationary positions, and forming a small hole or passage in the screwed spindle for a short distance from the point upwards, which meets side holes also formed in such spindle, in order that when it is screwed down into the steam nozzle there shall still remain a small passage for the steam, which in starting the injector induces the water to enter the apparatus. This injector has only one moveable part, and still it is capable of injecting fluids at varying pressures, say from 12 to 150 lbs. to the square inch.

A.D. 1874, January 26.—No. 328.

DYER, Edward, of Anstey Alton, in the county of Hants.—" Improvements in the construction of " fire escapes and in means of preserving them from the action of heat."

The escapes are made ladder fashion of wire rope and with wooden spokes prepared in a solution of borax, tunstate or phosphate of soda.

A.D. 1874, January 26.—No. 329.

WILDE, Thomas, of Hyde, in the county of Chester, land agent.—" Improvements in the construction of " railway chairs."

The chair consists of a sole plate and a fixed jaw cast in one piece, and a movable jaw so constructed and fitted thereto that the weight of the rail itself causes the said movable jaw to hold the web of the rail firmly, and the greater the weight of the engine or train passing over the rail the more firmly will the movable jaw be held against the web of the rail.

A.D. 1874, January 26.—No. 330.

CANNON, Thomas, of the firm of Edward Cannon & Sons, of the city of Dublin, Ireland, glue manufacturers.—" Improved machinery or apparatus for preparing materials for the manufacture of glue."

The invention consists mainly in an improved construction and arrangement of the rotating tumbler or drum in which the materials are prepared or treated.

The tumbler as constructed according to my improvements differs from the ordinary at all times open thick wooden tumbler, in that it is made of iron or other suitable metal and is constructed so that it can be used as an open or as a closed tumbler, and is divided into compartments by diagonal plates of metal instead of of wood as hitherto.

My improvements therein consist further in forming or providing the circumference of each compartment at one part with a doorway which is closed or shut by a hinged door secured by pins, and at another or other parts with cuts, holes, slots, slits, or other perforations, which being left uncovered form the said open tumbler, or which may be covered by removable shutter doors to form the said closed tumbler.

The shaft on and with which this improved tumbler rotates is also made of metal and receives the inner edges of the metal diagonal plates, and is made hollow with radiating slits or apertures leading through its circumference to the compartments of the tumbler.

The bearings of the shaft are placed on side bricks or other supports between which the improved tumbler is situated.

At each of its ends the shaft is connected with a system or arrangement of pipes (provided with three cocks or taps, or with a three way cock or tap,) which communicate with a water main and also with an acid tank placed on suitable supports above the tumbler.

The tumbler as above constructed and arranged may be actuated by the system of driving gear heretofore in use for driving the ordinary open wooden tumbler.

At the time of supplying the compartments with the materials to be treated, the tumbler is turned in the proper direction by a hand or spoke wheel placed on the squared-end of a spindle or shaft carrying a double-acting ratchet wheel, controlled by a double-acting or two separate pawls, and also a pinion in gear with the driving wheel on the tumbler shaft.

A.D. 1874, January 26.—No. 331.

HOWARD, James, of Bedford, in the county of Bedford, agricultural engineer, and **BOUSFIELD, Edward Tenney**, of the same place, engineer.—" Improvements in steam boilers."

The object of the present invention is to improve the class of tubular boilers, for novel arrangements of which we have obtained at various times Letters Patent. Among these patents are the following, viz., one bearing date Decr. 30th, 1869, No. 3770, another dated 25th March, 1872, No. 905, and another April 3rd, 1873, No. 1237.

By our present improvements we obtain increased efficiency in working, and an economy in the consumption of fuel, and we also secure facilities for cleaning, and for inspection and repairs.

A.D. 1874, January 26.—No. 332.

NOAKES, Edward, of Lamberhurst, in the county of Kent, engineer.—" Certain improvements in the " construction of kilns for curing hops, and in the process employed therefor."

The novelty of the invention relates to the drying and curing of hops by means of hot water pipes, so placed that they will cover the whole area of the floor or house or kiln in which the hops are placed, the ventilation of the building being effected by means of louvers and cowls in the ordinary manner.

A.D. 1874, January 26.—No. 333.

ADAMS, John Stowell, of the city of Boston, in the state of Massachusetts, in the United States of America.—(*A communication from John Collicatt, a person resident at the said Boston.*)—"Improvements in "kaleidoscopes."

In these kaleidoscopes a greater range of blended forms, shapes, colors, and patterns is provided than is found in the ordinary kaleidoscope. A box or case encloses clockwork machinery; at one end of the said box a standard is erected which supports an ordinary kaleidoscope-tube, with the opening for the eye at its upper end. Under the kaleidoscope tube is a rotating flat table, circular in shape. This table is highly ornamented, and various discs of all shapes, colors, and designs may be placed upon the same.

A.D. 1874, January 26.—No. 334.

TILLMAN, Samuel Dyer, of Jersey city, in the county of Hudson and state of New Jersey, in the United States of America.—"Indicators for determining chords and musical intervals of the diatonic scale, also, latitude, longitude, and relative time of places on either terrestrial or celestial planispheres."

The first part of the invention relates to a new and improved instrument for indicating all musical intervals and common chords.

The object of this part of the invention is to indicate and measure by means of musical scales the diatonic intervals and common chords belonging to the same tonic in the minor mode. Also to make the instrument embracing fixed and movable scales in a cheap and effective form.

The second part of the invention relates to an instrument to ascertain or show readily the latitude and longitude and relative time of any place on the earth's surface.

A.D. 1874, January 27.—No. 335.

SUMMERFORD, James Stephen, of 4, Hemming's Row, W.C.—"An improvement in a reclining chair."

The invention claimed is an arrangement for altering the length of the back of a folding chair, by which means the seat may be raised or lowered to any angle, thus allowing the chair to be used upright as an ordinary sitting chair, or extended to any position as a lounge,—no other chair can be used for both purposes.

A.D. 1874, January 27.—No. 336.

CUNNINGHAM, David, of Stewarton, in the county of Ayr, North Britain, and **DOUGLAS, Alexander**, of Kilmarnock, in the same county, Scotch bonnet manufacturers.—"Improvements in the manufacture of "Scotch or other similar bonnets, caps, or hats."

In carrying out the invention, the fabric to form the bonnet, cap, or hat, is woven in a hand or power loom so as to require no subsequent seaming, but so as when each portion is taken from the loom it can be at once submitted to a fulling mill, and be treated and finished like the knitted fabric hitherto generally employed for making such articles. To obtain the woven fabric of the requisite form for a Scotch bonnet it is woven in four plies.

A.D. 1874, January 27.—No. 337.

WORMALD, David, of Leeds, in the county of York.—"Improvements in machinery or apparatus "employed in the manufacture of cut nails."

A barrel is hinged to carrier, and there is a nipper or holder on end of shaft for "screeds" or strips, the latter are turned over after every cut by an intermittent rotary motion of the shaft, which also has a traversing motion to feed the "screed" or strip to cutting machine. The screed or strip when turned is also raised from block by oscillating movement of barrel.

Provision is made for stopping machine, also for the shaft to be drawn back to receive a fresh "screed" or strip.

A.D. 1874, January 27.—No. 338.

BURTON, Charles Coe, of Youngs Farm, Lambourne, in the county of Essex.—" Improvements in " wheels for traction engines and for other uses where a considerable area of bearing surface is required."

This Provisional Specification describes a wheel consisting of a cast iron boss with an annular cavity within it in which a strong hoop spring is lodged. Beyond this cavity radial spokes are fixed in the boss, and they carry two fixed hoops or tyres of ⊥ section. There is also another series of spokes which are able to slide radially through holes formed for them in the boss; their inner ends abut upon the hoop spring and their outer ends are attached to an endless chain of shoes.

Instead of the hoop spring, the requisite elasticity is sometimes obtained by means of air under pressure.

A.D. 1874, January 27.—No. 339.

KYTE, Charles, of 3, East India Avenue, in the city of London.—(*A communication from Joel Wilson, of Dover, New Jersey, in the United States of America.*)—" Improvements in furnaces applicable for reducing " iron ores preparatory to working the same into manufactured iron."

This Provisional Specification describes a furnace for effecting the cementation of iron ore; the furnace is heated by the waste gases from a balling or other furnace.

A.D. 1874, January 27.—No. 340.

SWALE, Sydney, of Hull.—" Apparatus and means of preserving life at sea."

Tubes or cylinders with conical or hemispherical ends made of strong waterproof material and combined together, each being filled to a greater or lesser extent with cork or other suitable material, leaving a well or pocket in each tube, having a water-tight cover thereto, for receiving valuables.

These tubes are secured and bound together by a rope or ropes surrounding them, to which beckets are secured, for enabling persons to insert their legs therein and otherwise to secure themselves thereto. These tubes or cylinders may be made up like a matrass, and be used or employed as such in cabins and state-rooms. For this purpose the spaces between the tubes and the sides thereof may be filled with fibrous material, upholstery fashion.

A.D. 1874, January 27.—No. 341.

HILL, Henry Cheetham, of Staleybridge, in the county of Lancaster, cotton spinner.—" Improvements " in machinery for winding yarn and thread."

My invention consists in applying a rail in front of the row of spindles, or in other suitable position, and in fixing to this rail, guide plates of steel, the edges of which are left sufficiently apart for the passage of the yarn or thread to the spindle. A to and fro motion along the slits between the guide plates is given to the yarn or thread by means of a rocking bar placed below.

A.D. 1874, January 27.—No. 342.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Eugène Charles Maldant, of Paris, France, civil engineer.*)—" An improved " apparatus for maintaining a constant level of water in wet gas-meters, and for separating from vapour " liquid held in suspension in the same."

My said invention has for effects the mechanical separation or condensation of the water contained in the gas as it leaves the meter. This water of condensation, by means of the said improved apparatus, is recovered and caused to return to the meters in such a manner as to prevent or retard the sinking of the normal level of the water; consequently the constancy and exactitude of their measurement will be maintained, and at the same time the cost of their supervision and repairing will be diminished.

A.D. 1874, January 27.—No. 343.

WILDE, Joseph, of Hadfield Street, Walkley, Sheffield, manager of saw manufactory.—" Improvements " in machinery for grinding and polishing all kinds of saws, files, or other flat metal surfaces."

The novelty of the invention consists in mounting two grinding or polishing wheels in suitable frames, so as to make them readily adjustable as to their distance apart, and running them in one direction, so that at the point of their peripheries where the articles are submitted to their action, they will run in contrary directions.

The articles whilst being ground or polished are presented to the action of the wheels by means of guide rollers.

A.D. 1874, January 27.—No. 344.

WOLF, Eduard, of Fore Street, in the city of London, merchant.—" An improved pipe for smoking."

This pipe has two bowls, with stalks for receiving the stem and mouthpiece, each bowl acting in turn to receive the tobacco or the juice therefrom.

A.D. 1874, January 27.—No. 345.

SMITH, George, of Queen's Gate, Hyde Park, in the county of Middlesex, esquire.—"An improved "beverage or artificial apollinaris water."

This invention relates to a manufacture of a beverage or artificial apollinaris water. The ingredients mentioned are bicarbonate, sulphate, and phosphate of soda, chloride of sodium, carbonates of magnesia, and lime, also chemical equivalents. The ingredients are pulverized, mixed, and charged with gas or other agents for aerating.

A.D. 1874, January 27.—No. 346.

GLOVER, Henry, of Bow, in the county of Middlesex.—" Improvements in the manufacture of sulphuric "acid."

This invention relates to improvements in effecting the concentration of weak sulphuric acid, such, for example, as that known as chamber acid or brown acid, so as to produce or manufacture sulphuric acid of commerce; and consists in effecting such concentration by means of highly heated air or gases which are not acted upon by sulphuric acid; and causing such heated air or gases to be forced through and be brought in contact with the acid to be concentrated by preference in the form of finely divided streams or currents.

A.D. 1874, January 27.—No. 347.

TANDY, George Grainger, of Penge, in the county of Surrey, gentleman, and **DRYDEN, John Andrews**, of Battersea, in the same county, lamp maker.—" Improvements in lamps."

Our invention relates to that description of lamp which is employed in illuminating shop fronts. Instead of using gas as the illuminating medium I employ a liquid hydrocarbon, to which end the oil reservoir is made in the form of a long flat vessel which is made to fit close to the lower part of the reflector, and from which projects a horizontal tube carrying at its outer end a socket prepared to receive the burner.

A.D. 1874, January 27.—No. 348.

WHITTINGHAM, John, of Great St. Helen's, in the city of London, merchant.—(*A communication from J. H. Payne, of Melbourne, in the Colony of Victoria.*)—" Improved apparatus for manufacturing gas for "illumination."

This invention relates, 1stly, to distilling coal to obtain a greater percentage of gas; 2ndly, to a new construction of scrubber in which the gas is rapidly cooled and cleansed of some of its impurities; and, 3rdly, to a novel construction of purifier which admits of the purifying material when saturated being quickly removed and replaced by fresh material.

A.D. 1874, January 27.—No. 349.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Sebastian Jacobsohn, of Paris, in the Republic of France, engineer.*)—" An improved apparatus "for cleaning or polishing floors, and other like surfaces."

The essential features of this invention consist in the use of a frame supported in a roller, and provided with brushes, which are rotated through the intervention of a suitable gearing by an operator seated upon the apparatus, for the purpose of dry rubbing, cleaning, or polishing floors, or other like surfaces.

A.D. 1874, January 27.—No. 350.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Francis Wayland Allin, of the city, county and state of New York, United States of America*).—" Improved machinery for cutting and screw threading pipes."

This invention consists, first, in a means for moving the cutting-tool gradually up to its work as the tool is revolved around the pipe or bar to be cut off; second, in mechanism for holding the screw die and revolving the same around the pipe to cut the screw thereon.

A.D. 1874, January 27.—No. 351.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Daniel Thomas Casement, of Painesville, in the county of Lake, and state of Ohio, United States of America.*)—" Improvements for the more effectual combustion of fuel in furnaces and other fire-" places."

The present improvements are based on a former application for Letters Patent, dated January 6th, 1874 (No. 69), and consists in suspending balls or other pieces of metal from the top or sides of a furnace, by rods or chains of bessemer steel or other metal, adapted to resist great heat, instead of supporting them on a grate; or the rods or chains may be substituted altogether for the balls. The invention also relates to the employment of a vertically adjustable fire grate in combination with these gas consuming layers or strata of metal balls or pieces.

A.D. 1874, January 28.—No. 352.

HORROCKS, JAMES, of Eccles, in the county of Lancaster.—" Improvements in furnaces for supplying " heat to steam-generators, and for other purposes."

This invention relates to Letters Patent granted to the same inventor, on July thirtieth, one thousand eight hundred and seventy three, for an improved furnace.

The present invention consists in using perforated bricks or blocks for the lining, also in dividing the air-spaces into sections, the inlet of air into which can be separately regulated, and in admitting steam into such air-spaces to lower the fire.. Also in forming a chamber at the bottom of the furnace, which can be separately supplied with air, and which can be repaired without interrfering with the upper lining; and in forcing air into the said air-spaces.

A.D. 1874, January 28.—No. 353.

CHARLES, PETER, of Stoke Newington, in the county of Middlesex.—" Improvements in apparatus for " controlling the supply of water to closets, lavatories, and other places; and preventing waste."

The apparatus consists of a measuring cistern provided with an outlet pipe rising to a certain height in the same, and on which a hollow box or displacer is fitted to rise and fall, whereby the water is made to overflow into the outlet pipe when desired, a portion being also retained as after supply to seal the basin (in the case of a closet).

A.D. 1874, January 28.—No. 354.

GILBEE, WILLIAM ARMAND, of the firm of L. de Fontainemoreau and Co., 4, South Street, Finsbury, in the county of Middlesex, patent agent.—(*A communication from Emil Boëthius, of Stockholm, in the Kingdom of Sweden.*)—" Improvements in cork cutting machinery, parts of such improvements being applicable to " other purposes."

This improved machinery is designed and constructed with a view to operate on the same principle as that followed in cutting corks by hand; and whereby it is rendered applicable to all kinds of the raw material; an economy of labour is effected; and the machinery is easily worked. The improved machinery is applicable to cutting various sizes of corks, whether of a cylindrical, conical, or oval form.

The first part of these improvements relates to an improved machine for cutting or dividing the cork-wood or bark into strips, the machine being provided with a circular rotary knife or cutter, and an arrangement of rollers for sharpening the said knife or cutter fixed in a moveable frame.

The second part of these improvements relates to an improved machine for paring or barking the strips of cork made from thick bark. In this machine the whetting rollers for sharpening the circular rotary knife or cutter are attached to a directing bar running in guides at the sides of the moveable frame carrying the knife.

The third part of these improvements relates to an improved machine for cutting the strips of cork into pieces or squares suitable to be made into corks. This machine is also provided with a moveable frame carrying a circular rotary knife and whetting rollers so arranged that an intermittent up and down motion is communicated to the knife, the whole being so arranged that the breadth of the piece of cork cut by the knife is determined by the width of the strip.

The knives and whetting rollers hereinbefore described are applicable to cutting other materials than cork, such as paper, pasteboard, and india rubber.

The fourth part of these improvements relates to an improved machine for cutting or shaping the pieces of cork into corks for bottles. In this machine the knife, which is straight, has a forward and backward motion, obtained by gearing working an arm connected to the knife bar, and the whetting apparatus is moveable. An apparatus is also provided for the introduction of the cork, and also with an arrangement for giving the cork an oval shape.

A.D. 1874, January 28.—No. 355.

REED, John, of Bolton, in the county of Lancaster, bricksetter and contractor.—" Improvements in boilers " and furnaces."

My invention consists in making a perforated casing at the inside and near the top of the boiler, into which casing the steam penetrates, and from this casing four or other convenient number of tubes are carried down into flues which deliver the steam under the grate bars of the furnace.

A.D. 1874, January 28.—No. 356.

MANN, William Thompson, of the firm of Fawcett, Preston, and Company, of Liverpool, in the county of Lancaster, engineers.—(*A communication from James Watson, of Calcutta.*)—" Improvements applicable " to cranes."

This Provisional Specification describes the employment of a back balance weight for drawing back the chain after a weight has been lowered.

A.D. 1874, January 28.—No. 357.

TAYLOR, Ephraim, of Blackburn, in the county of Lancaster, machinist.—" Improvements in washing " machines."

The tub is formed with an earthenware, glass, or enamelled metal bottom.

The framing carrying the squeezing rollers is cranked outwards so that the rollers may be wider than the tub. It is also cranked backwards so as to clear the dasher shaft and leave the greater portion of the tub uncovered.

The bearing in the top rail in which the dasher shaft works is covered by a cap secured by a pin or screw.

The dasher shaft is shortened by its bevel wheel being placed below the centre of the one driving it, and below the top bearing.

The horizontal shaft works in a long socket on the top rail.

A.D. 1874, January 28.—No. 358.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Walter Hart, of Philadelphia, Pennsylvania, United States of America.*)—" Improve- " ments in self-braking, lowering, and hoisting apparatus."

This invention relates to an arrangement of apparatus for preventing accidents in raising and lowering boats and other objects by causing the weight of the load to constantly and automatically apply a brake to the draught rope or ropes through the medium of a lever or levers and to thus arrest its own motion, the removal of the brake requiring the constant attention of an operator, any inattention on the part of whom can only result in the reapplying of the brake and the stopping of all movement.

A.D. 1874, January 28.—No. 359.

WEST, William, of Birmingham, in the county of Warwick, jeweller, and **SPITTLE**, William Frederick, of Birmingham, aforesaid, manager of works.—" Improvements in solitaires, sleeve links, and " other like dress fastenings."

This invention refers in part to an invention patented by William West one of the applicants, on the 13th of September 1872, No. 2722; and the present improvements consist in making the case or box in which the spring bolt of the fastening works, as well as the said bolt, capable of a sliding motion. By this construction both the bolt and the box engage with and on opposite sides of the head of the inclined collar on one part of the fastening and thus connect the two parts of the fastening together by a double bolting action. The two parts are released by pressing the spring bolt and box in opposite directions so as to simultaneously withdraw them from the inclined collar.

The improvements described are also applicable to solitaires, sleeve links, and other like fastenings, in which a spring bolt engages with a hooked arm turning on a joint. The joint pin and arm of the last mentioned fastenings are made from one piece of metal for the purpose of preventing the loss of the joint pin.

A.D. 1874, January 28.—No. 360.

HAHN, Friedrich, of Bloomsbury Street, in the county of Middlesex, Professor of Chemistry.—"Improvements in the manufacture of compressed fuel, and in apparatus therefor, and for other like purposes."

My said invention relates chiefly to the manufacture of compressed fuel from coal dust. I use a double chambered baking or heating oven constructed for the reception of pans for holding the materials being treated. The coal dust or small coal is first mixed with a small percentage of ground pitch or other like material and put into these pans which pass into the oven, whence the mixture is taken to moulds connected to endless chains, which pass over wheels one above the other, and compress and deliver the material. The aforesaid moulds open upon pivots. An important feature of my invention is the obtaining of the necessary power from the weight of the coal or other material in the moulds.

A.D. 1874, January 28.—No. 361.

MAPLESDEN, James, and BUSS, William, both of Bethersden, in the county of Kent.—"Improvements in or connected with ploughs."

First. The draw bar is attached to "shead" and coulter and there is an elongated loop capable of receiving a to and fro and up and down motion on a vertical rod hooked to forward end of draw bar to which the billet is hooked at the other end.

Second. A bar is connected direct to share and the sleigh to beam and bar by rods.

Third. The share is made with a piece of steel projecting from rear to receive bar; the fore end of share has a piece of metal leading up and attached to "shead."

A.D. 1874, January 28.—No. 362.

BUCKNALL, Frederick, of Kirton, in the county of Lincoln, agricultural implement maker.—"Improved machinery or apparatus for digging potatoes and other agricultural roots, and for cultivating land."

My improved machinery or apparatus for digging or cultivating land consists of a rotating digger or tool provided with any convenient number of pairs of prongs or digging forks, which are fixed in a hub or nave mounted on one end of a rotating shaft, which is driven by a large bevil wheel on the axle of the running wheels. In combination with this rotating digger there is a share and breast board which will regulate the action of the diggers.

A.D. 1874, January 28.—No. 363.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Harriet Ruth Tracy, and John Warren Lawton, both of the city, county, and state of New York, United States of America.*)—"Improvements in sewing machine cabinets."

The invention consists in providing sewing machine cabinets and tables with a set of drawers, so arranged that they may be closed into the cabinet when not required, and swung out into a convenient position for use; and also with an extension or drop leaf to enlarge the table of the machine when required.

A.D. 1874, January 28.—No. 364.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Charles Rhodes Goodwin, of Paris, France.*)—"An improved instrument for cutting button holes and slits."

This invention relates to a device for cutting button holes or slits in all kinds of materials, consisting of a thin pointed steel blade of angular form having cutting edges and provided with a gauge for regulating the length of the button hole, which is clipped in the desired position by a binding screw or otherwise.

A.D. 1874, January 29.—No. 365.

OMERVILLE, George, and CROMBIE, George, of Edinburgh, in the county of Mid Lothian, North ritain, engineers.—"Improvements in the arrangement and construction of guillotine machines for cutting paper, cardboard, leather, cloth, and other similar materials."

The features of novelty which constitute this invention consist in steadying or guiding the knife at three ints whilst penetrating diagonally through the material being operated upon; in regidly securing the fe holder and lower beam together; and in arranging the pull of the crank in the same direction as the rel of the knife.

A.D. 1874, January 29.—No. 366.

Y, David, engineer, of Middlesbro', in the county of York.—"Improvements in hydraulic motive ower engines."

his invention consists in retarding the return stroke of the piston at each end of the cylinder by king it act partially as a valve & checking the passage of the water out of the cylinder, and also ucing the opening to admit water for the return stroke.

lso in the use of a single cylinder with a slide or cylindrical valve, the whole covered with a cast chest.

lso in actuating the valve distributing water to the small cylinder working the main valve by water nitted to it.

lso in actuating the main valve during a part of its stroke by the movement of the piston.

lso in employing a double beat or balance valve for admitting and regulating the supply of water to engine.

lso in regulating the speed of the engine by shortening the stroke of the main valve by stops actuated gear outside the valve chest.

A.D. 1874, January 29.—No. 367.

ERHARD, Frederick William, of Coseley, in the county of Stafford, metallurgical chemist.— Improvements in the purification of iron ores and other compounds containing iron, and in the production of iron therefrom."

This invention relates to certain improvements upon the subject matter of Letters Patent granted to me he said Frederick William Gerhard and James Light, junior, of Bradley, in the county of Stafford, for 'Improvements in the production of iron and steel," dated 16th day of May, A.D. 1872, No. 801; and consist, firstly, in certain improved means of extracting the sulphur, phosphorus, or other deleterious ingredients; and secondly, in an improved process for manufacturing iron from such purified ores or compounds containing iron.

A.D. 1874, January 29.—No. 368.

KAYE, George Rusby, of Belgrave Gate, Leicester, in the county of Leicester, manufacturer.—"Improvements in apparatus for cutting or reducing meat into small portions for various purposes."

The object of the invention is to simplify the process of cutting or reducing meat into small portions without crushing or pulverizing it, so as to facilitate the use of such meat for various purposes.

The meat having been, as is usual, cut into somewhat small portions, is fed by a hopper or guide to between pairs of circular cutters applied to axes in pairs, so that the cutters of one axis may overlap those of the other. The extent of overlapping and the distance apart of the respective pairs of cutters on the axes will depend on the extent of reduction required or the use to which the meat when cut is to be applied.

Several of such pairs of axes may be applied in order to the meat being operated upon by them in succes-ion, or the meat may be repassed between the cutters of one or more pairs, as desired.

The respective axes are geared together so that motion imparted to one by hand or power will be simul-aneously communicated to the other or others, and at various relative surface speeds, as desired. Each set f cutters is provided with fixed combs or clearers to clear them of the cut meat after cutting.

The cutting edges of the respective cutters are bevilled or inclined on one side only, with the cutting edge one to that of the other of each pair.

I also apply other rollers with teeth on their surfaces, such rollers being capable of being brought into use hen desired to act on the meat after it has been cut by the cutters to further reduce the meat or break the ain of it.

A.D. 1874, January 29.—No. 379.

SNELL, Henry Saxon, of Southampton Buildings, in the county of Middlesex, architect.—"Improvements in the construction of stoves or apparatus for heating purposes."

The fireplace is enclosed at back, at the sides, and at the top with a water chamber, thro' which water from a reservoir placed above, is made to circulate and pass into a system of tubular heating vessels, among which air that may be brought from outside the room, is made to circulate or pass before it is allowed to escape into the room.

A.D. 1874, January 29.—No. 380.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—(*A communication from Henry Julius Smith, of Boston, in the state of Massachusetts, in the United States of America.*)—"Improvements in electrical machines."

The following are the claims to this Complete Specification :—

1. A generating plate and a flat condenser placed parallel to each other within the same casing substantially as described.

2. A Leyden jar or condenser constructed of vulcanized rubber and metallic plates substantially as described.

3. So arranging the jar or condenser that the forward motion of the crank, to generate electricity and charge the jar, moves the jar forward through a small arc, whereby its terminals are moved away from the electrodes.

4. The device for discharging the jar by the retrograde motion of the crank, bringing the posts 3 and 2 into contact with the electrodes V and W.

5. Placing the firing points of the condenser at a distance from the collecting points substantially as described.

6. The stop X, limiting the forward movement of the jar substantially as described.

7. The combination of a generating plate, a condenser, and a casing made air tight as described, together with electrodes in the air tight casing, and their projections by which the condenser is discharged, substantially as described.

8. The pouch O surrounding the machine proper substantially as described, for the purpose described.

9. The hard rubber cushions I and K, when constructed with springs, substantially as described.

10. The machine proper herein described, when confined within annular metallic plates by bolts and screws as shewn in figures 9 and 10.

A.D. 1874, January 29.—No. 381.

NORTON, Thomas, of Cuttlehurst Mills, near Huddersfield, and **HELLAWELL, Henry**, of Kitchenroyds, Denby Dale, in the county of York.—"Improvements in weaving velvets and other piled fabrics, and in apparatus employed therein."

This Provisional Specification describes the use in place of grooved terry wires of two thin steel blades held together at their ends, and between which the knife, by which the pile is cut, is able to pass.

A.D. 1874, January 29.—No. 382.

THORNYCROFT, John Isaac, of the firm of John I. Thornycroft and Company, of Church Wharf, Chiswick, in the county of Middlesex, steam yacht and launch builders.—"Improvements in light-draught screw-propelled vessels, and in facilitating their propulsion in shallow water."

Heretofore great difficulty has been experienced in effecting the propulsion in shallow water by screw propellers of vessels as ordinarily constructed, owing to the want of a sufficient body of water for the screw propellers to act upon.

Now this invention has for its object to obviate these difficulties by providing an increased depth of water in suitable chambers formed by making the under part of the hull with recesses sealed by the water the vessel floats in. The propellers are placed in these chambers, and air being exhausted, additional water enters.

A.D. 1874, January 29.—No. 383.

ARRISON, JAMES, of 52, Mornington Road, in the county of Middlesex.—" Improvements in the processes of evaporation, condensation, and refrigeration, in their relations and applications, and in the apparatus therefor."

This invention relates to improvements in the apparatus and processes for the reduction of temperature y the evaporation of volatile liquids and condensed gases, and to improvements in the application, directly r by intermediate carriers such as brine, of the cold produced for industrial purposes, which latter improvements are applicable from whatever source the cold may be derived. The improvements consist in the doption of new forms of boiler, one being a wedge shaped annulus of approximating plates, another f flat plates kept apart by intervening sheets of woven wire or studs on the surfaces, and a third conisting of tubes whose internal capacity is regulated by a central core covered with wire. As an adjunct the boiler there is a subsidiary vessel for purifying the volatile liquid while the main process is going on. he improvements consist also in the adoption of condensers similar in principle to the boilers, with the ldition of an exterior network to promote evaporation, which is further increased by connecting the surunding enclosure with the chimney draught. Another form of condenser, wherein the liquefaction of the por is accomplished by a jet of volatile liquid itself, is described. The vapor pump is fitted with slide lves, to make room for which, the cylinder covers are enlarged. A combination of slide and self-acting lves is also adopted, one of them, the outlet, when the pump is horizontal, having a ball rolling up an clined or curved channel. When both valves are slides their stuffing boxes are connected by a tube rminating in hollow rings in the stuffing. In large machines, the steam engine is placed between two apor pumps, and in small machines the pump is single acting, with a valve in the piston.

The return of the condensed liquid is provided for by a valve or cock actuated by a solid plunger rising and falling in the liquid. To get rid of air in the condenser, a vessel is provided containing a substance having an affinity for the vapor (in the case of ether, the absorbent being hydrated sulphuric acid), and communication is opened with the top of the return valve vessel, from which the mixed air and uncondensed vapor is passed at a pressure regulated by a safety valve, or by an ordinary pump, the vapor absorbent being afterwards recovered by distillation or decomposition. The improvements in the making of ice when a carrier of cold is employed, consists in making the first or second form of boiler of several series of plates, the liquid being evaporated in one compartment, while the brine flows through a similar adjoining compartment, the liquid and brine spaces alternating. Ice is also made on the exterior surface of the plates which are placed so far apart as to form between them the moulds in which the ice is produced, the moulds having removable bottoms, through which the ice is dropped, having previously been detached by means of hot vapor drawn from the condenser, warm water or steam being substituted when the ice is formed in fixed moulds, the exterior of which is traversed by brine. There is also an arrangement for combining the direct process of ice making with the employment of a stream of cold brine on different surfaces of the same boiler. In the making of ice in moveable moulds, the ordinary divisions in the trough are dispensed with, the moulds being placed in contact with the right and left sides of the trough alternately, and kept in their places by wires or bars. The water with which the moulds are supplied is first deprived of its air by connecting the top of the tank with a vessel in which a vacuum is formed by the condensation of steam. The improvements in the making of ice further consist in causing the water to flow in a thin film over a surface opposed to another surface, over which a stream of brine is maintained, the ice being formed by radiation, convection of the air, and by evaporation from one surface and condensation on the other, the water being supplied from a trough above whence it drips or is carried over by a syphon of textile material, the brine flowing in a suitable way or being raised by an endless textile web. The exterior of the boiler or an extension thereof is employed as a radiating surface. There is also an arrangement for the making of ice by the combined processes of conduction, radiation, convection, and evaporation, the conduction being in operation on one side, while radiation is going on opposite the other side, convection and evaporation going on between. The convection and evaporation are promoted by induced indirect currents of air, and the condensation is aided by the use of a brine made from a deliquescent salt. The improvements in the cooling of worts or other liquids consist in passing them in a film over the exterior of the boiler, or enclosing the tubes of the third form of boiler in other tubes for conveying water in an opposite direction to the worts. Another form of wort refrigerator is constructed on the principle of the second or third form of boiler, the water being passed through wired spaces and the worts flowing outside or through an adjoining wired space, the sheets of metal being set in india rubber, so that they may be taken apart and cleaned. The improvements in the eparation of paraffin and other solids from liquids holding them in solution consist in passing the stream of il or other solvent over the exterior of the boiler, or exposing it to an opposite radiating surface, or both. The mprovements in the cooling of air or gases consist in spreading the cold brine over surfaces of perforated etal, the perforations being made with the rough edges downward and upward alternately, the air being assed in an opposite direction to the brine. The condensation of the gas or vapor without contact with he brine, is effected by passing it through the alternate wired interspaces of a boiler of the second form.

A.D. 1874, January 30.—No. 384.

EDWARDS, John, of Cassland Crescent, South Hackney, in the county of Middlesex.—" Improvements " in the manufacture of valves."

The novelty is making valves of two metal shells with an inner disc and a spring inside to make the valve self closing.

A.D. 1874, January 30.—No. 385.

NEWBOLD, Edward, of the town and county of the town of Nottingham.—" Improvements in furnace " bars."

My invention consists in a furnace bar having grooves formed alternately on each side, the said grooves extending from the top to the underside of the said bar, and the teeth or those portions of the bar between the grooves being gradually tapered from the top to the underside of the said bar.

A.D. 1874, January 30.—No. 386.

SMITH, Frederick Charles, engineer, of Peckham, in the county of Surrey.—" Improvements in the " methods used for cutting or separating woollen fabrics or materials."

The principle of the invention is the cutting out or separating of the seams from woollen rags and other materials by means of a cutter revolving in contact with a roller which also revolves in the same direction; the cutter has two cutting edges at a sufficient distance apart to cut or separate both sides of the seam at once. The cutter and roller are actuated by a suitable arrangement of wheels and pulleys according to the nature of the power applied.

A.D. 1874, January 30.—No. 387.

KAY, Robert Henry, and **RICHARDSON, Alfred Thomas**, of the firm of Kay and Richardson, of 39, Gutter Lane, in the city of London, crape manufacturers.—" Improvements in the manufacture of silk " crape."

Our invention consists in making a fabric of the silk commonly called " spun silk," including the different varieties thereof. The spun silk is first spun in the ordinary manner, and then we impart an extra amount of twist (in a throstle frame) to the yarns, either in water or not; the yarns so prepared are then woven in an ordinary loom and the fabric is finished as usual.

A.D. 1874, January 30.—No. 388.

ISAACS, David Meyer, of Manchester, in the county of Lancaster, minister of the Old Hebrew Congregation.—" An improved fire escape."

This invention relates to the construction of an internal fire escape which can be placed in any room as an article of furniture and can at any time be used as a fire escape with the least possible delay.

A.D. 1874, January 30.—No. 389.

WOOD, James, of Birmingham, in the county of Warwick, engine turner.—" Improvements in the " ornamentation of papier maché and other japanned wares."

This invention consists in ornamenting the articles above named by the operation of engine turning.

A.D. 1874, January 30.—No. 390.

POWLETT, James Albert, of Liverpool, in the county of Lancaster.—" An improved steering apparatu " for ships or other navigable vessels, to be worked by steam, compressed air, or other expansive motiv " agent."

This invention relates to the direct application of an expansive motive agent, such as steam, compres air, or gas, for the purpose of steering or guiding ships or other navigable vessels; and consists, firstl of an apparatus for directly actuating the rudder; secondly, of a series and system of valves for supplyin regulating, and controlling the power supplied; and thirdly, in a means of working such valves so th the power supplied can be regulated and controlled by the steersman or actuator in such a manner th any required degree of angle can be given to the rudder, "spoke by spoke," starboard or port, as wi an ordinary mechanical steering apparatus.

A.D. 1874, January 30.—No. 391.

WOODCOCK, Thomas, of 220, South Road, Walkley, in Sheffield, in the county of York, carver.—" An " improved mode of carving the horns of other animals so as to imitate the horns of the stag."

The invention consists of a series of revolving cutters so constructed as to produce eccentric protuberances in imitation of stag's horns, and by means of a description of chisel, graver, or punch (called a wriggler) and the other appliances in Specification, the work is finished to the fineness required.

A.D. 1874, January 31.—No. 392.

BEAUMONT, Frederick Edward Blackett, of No. 2, Westminster Chambers, Victoria Street, in the city of Westminster, Major in the Royal Engineers.—" Improvements in apparatus for steering vessels " by the action of fluid pressure."

According to this invention the pistons of two cylinders are arranged to gear by means of toothed racks or otherwise with the opposite sides of a wheel fixed on the rudder's shaft, or they are connected by chains to a rudder head. The two cylinders are connected at one end by a pipe having a cock, and at the other end they are connected by ports to a valve-box supplied with fluid under pressure, and containing a valve which is moved by a spindle actuated from a distance either by fluid pressure apparatus or by an electro-magnetic apparatus (arrangements of which are described), so as to cause the fluid pressure to enter the one cylinder or the other, according as the rudder requires to be moved to the one side or the other. The ends of the cylinders that are connected by a pipe with a cock are filled with a liquid, so that as the pistons are moved the liquid passes from the one cylinder to the other through the said pipe if the cock be open; but if it be desired to hold the rudder in any desired position, this is effected by closing the cock on the pipe. In some cases, only one cylinder is used for working the rudder, in which case the before-mentioned valve-box communicates with both ends of the cylinder so as to admit fluid pressure to the one end or to the other, and the rudder is held in position either by throttling the exhaust, or by connecting an extension of the piston rod to a piston in a small cylinder filled with liquid; the two ends of this cylinder are connected by a pipe having a cock, so that if the cock be open the liquid passes from the one end of the cylinder to the other as the piston moves, but by closing the cock the piston is held stationary.

A.D. 1874, January 31.—No. 393.

WEBSTER, John James, of 42, Westbourne Road, Birkenhead, & **THOMPSON**, James George, of Salisbury Lodge, Birkenhead, in the county of Cheshire.—"Improvements in apparatus for cleaning "tramway tracks."

This invention consists in providing beneath the tramway cars circular brushes mounted on a shaft carried in swing frames, so that the brushes can be raised from or lowered down upon the track. On one of the axles of the car is a drum, and on a swing frame or bracket is mounted a friction drum in such a manner that by means of a lever fixed to the frame it can either be pressed against the axle drum or moved out of contact therewith. A pulley on the shaft of the friction drum is connected by a band with a pulley on the shaft of the brushes, so that when the friction drum is in contact with and rotated by the axle drum, rotary motion is imparted to the brushes so as to clear the tracks. On raising the lever of the friction drum so as to take the latter out of contact with the axle drum, the lever in meeting a projection on the frame carrying the brushes is also made to raise the frame and consequently to lift the brushes off the tracks.

A.D. 1874, January 31.—No. 394.

GIRVAN, James, and **CATHRO**, John James, of Glasgow, in the county of Lanark, North Britain, paper stainers.—(*Partly a communication from Hypolite Lecerf, residing at Paris.*)—"Improvements in ornamenting paper for hangings and other purposes, and in apparatus therefor."

In carrying out the invention a uniform dead surface is first formed on the paper by means of what is known to paper stainers as "satin ground," or similar materials, and then stripes or portions of such surface of any desired ornamental configuration are made to appear bright as though burnished.

A.D. 1874, January 31.—No. 395.

MACLEAN, Robert, of Glasgow, in the county of Lanark, North Britain, accountant.—"Improvements "in apparatus for preventing railway accidents."

This invention relates to simple and easily applicable means for preventing railway accidents, and consists in arranging on a locomotive or other suitable part of a train apparatus to be acted on by an instrument on the railway, so as to give a danger signal that will appeal to the hearing of the engine driver or guard. An important part of the improved apparatus is a recording indicator, which whilst confirming the sound signal on being looked at, will afford positive proof of the signal having been made, and so prevent any dispute or uncertainty afterwards arising as to that fact.

A.D. 1874, January 31.—No. 396.

BLAKE, James, of Manchester, in the county of Lancaster.—"Improvements in steam-generators and in "safety-valves therefor."

According to this invention the rings of internal boiler flues are made conical and are flanched to meet, or are united by diminishing rings. The internal flues of a double-flued boiler are connected with a cross-flue near the bridge, and fitted at that point with deflecting-tubes or chambers. The area of the fire-box of a vertical boiler is contracted at two or more points, and "bafflers" are arranged to cause the flames to impinge on the vertical water-tubes. In some cases fire-tubes are placed within the water-tubes. The upper ends of water-tubes are provided with bend deflector mouth-pieces. The circulation partitions are formed with deposit-collecting-pockets. Water-tubes are arranged in clusters connected with short tubes fixed in shell. Convex safety-valves are seated on two or more concentric seatings, and are formed with internal steam passages.

A.D. 1874, January 31.—No. 397.

DEARMAN, Richard, of Chorlton upon Medlock, in the county of Lancaster, hot water apparatus maker, —"An improved mode of economising fuel and consuming smoke."

In ordinary furnaces and fire places there is a considerable space left between the fuel and the under side of the boiler or flue or other article to be heated. Now my invention consists in making the fuel to fill up the entire space between the grate bars or bottom of the furnace and the boiler or flue or other article, so that the air which is drawn into the furnace by the chimney must pass through the incandescent fuel, thereby consuming the smoke.

A.D. 1874, January 31.—No. 398.

LEIGH, Evan Arthur, of the city of Manchester, in the county of Lancaster, engineer.—"Certain "improvements in carding and spinning cotton, wool, and other fibrous substances, and machinery or "apparatus therefor."

This invention consists, first, in constructing the main cylinder, doffing cylinder, and rollers of carding engines each of three sheet iron plates, each plate forming a third of a circle and pressed hot to the curve corresponding with the diameter of the intended cylinder or roller, the plates of the main and doffing cylinders being fixed to rings, and the ends of the plates of the small rollers having fixed to them malleable cast iron flanged discs provided with studs or bearings.

Secondly. In setting the rollers and flats of carding engines by using bevil wheels and raising or lowering the pedestals by means of screws, each having upon it a pinion gearing into the crown wheel.

Thirdly. In making the spindles used in ring and traveller spinning frames hollow, and attaching to each warve a cup which receives the bottom of the bobbin and drives it round without the necessity of a steady pin or without the bobbin fitting tight upon the spindle, which runs in a pocket fixed to the bolster rail.

Fourthly. In placing the tin cylinder or driving roller of ring spinning frames and throstles lower down than usual, and placing between the warves and the driving cylinder short tin cylinders or rollers of smaller diameter; and,

Fifthly. In driving throstles and spinning frames by placing the driving shaft about six inches from the floor, and driving every two frames from it by means of a pair of oxtooth wheels and friction clutches, or other arrangement of gearing.

A.D. 1874, January 31.—No. 399.

HUGHES, Hesketh, of Homerton, in the county of Middlesex, and of Birmingham, in the county of Warwick, engineer.—"Improved means of and apparatus for producing ornaments and designs, also "goffers, plaits, and crimps in ribbons and other fabrics and cords."

This relates to improved means and apparatus for producing ornaments and designs, also goffers, plaits, and crimps in ribbons and other fabrics, whereby, firstly, diagonal angular crimping and other shapes can be produced by chain goffering machines upon fabrics. Secondly, to the formation of leaves or pattern formers for diagonal or angular and other shapes of crimping and goffering in chain machines. Thirdly, to the employment of hinged pattern frames in over chain goffering machines. 4thly, to an arrangement and employment of linked pattern formers for chain goffering machines. 5thly, to an arrangement and employment of compound linked pattern formers for chain goffering machines; and, 6thly, to means and apparatus for goffering and embossing the edges and other parts of fabrics, or the production of designs thereon when in connection with chain goffering machines.

A.D. 1874, January 31.—No. 400.

DAVIES, Henry Daniel, of 110, Cannon Street, in the city of London.—"Improved combination of "materials for roads and roadways to prevent horses slipping thereon."

This consists of a combination of asphalte proper with wood sawdust, preferably of the hardest kind of wood and of fine or coarse particles according to the nature of the traffic to be provided for, which I introduce gradually into the cauldron at the time of heating the asphalte which requires that treatment, and I then stir the mass until the whole is of the proper consistency before spreading.

A.D. 1874, January 31.—No. 401.

BLAXLAND, George, junior, of Brixton Road, in the county of Surrey, engineer.—"Improved means "and apparatus for gaining access to and for raising sunken vessels."

This invention has for its object the displacing of the water inside of a sunken ship or vessel by means of compressed air or gas, and in the apparatus employed for this purpose.

According to one part of this invention the vessel herself is made the means of holding the compressed air or gas so as to obtain access to and raise the same without the intervention of tanks, casks, pontoons, bags, or other similar means. Another part of these improvements relates to the application of an apparatus called an "air lock" without the addition of a diving bell for gaining access to the interior of a ship after a sufficient quantity of air has been forced down into the vessel to be entered and raised. This invention also relates to the application of a tube or pipe fitted with or without a valve for the outlet of the water from the interior of the sunken ship or vessel when it is being displaced by compressed air. This invention also relates to the application of a valve opening to the interior of a sunken ship or vessel for readmitting the water to the ship in case of any accident by which the compressed air should become so varified as to cause an undue pressure from the outside.

A.D. 1874, January 31.—No. 402.

COPPIN, William, of the Strand Foundry, Londonderry, Ireland.—"Improvements in the construction of "ships."

This Provisional Specification describes dividing a ship's bottom longitudinally into two or more sections with a clear water space or spaces running between them. The longitudinal lines of the sides are portions of a true circle running from end to end of the vessel. The keel or bottom line is of the same curve as the sides, the midship section of each is semi-circular below, extending vertically in a straight line upwards to accommodate the paddle wheels which are placed in the water spaces.

A.D. 1874, January 31.—No. 403.

LUMLEY, Thomas, of Harborne, in the county of Stafford, mechanical engineer.—"Improvements in "steam pumps."

This invention consists in working the steam cylinders of steam pumps by arranging at each end of the steam cylinder a chamber in a small cylinder, in which chamber a valve works for putting the cylinder in communication either with the exhaust or with the steam. An opening is made near each end of the steam cylinder, the opening at one end being in communication with the valve cylinder at the other end of the steam cylinder. As the piston approaches the end of its stroke, steam is allowed to pass through the opening in the steam cylinder to the valve cylinder at the other end of the steam cylinder, and the valve therein connects the steam cylinder with the exhaust; at the same time the steam cylinder piston strikes the valve at the same end of the cylinder and opens the steam way. The piston in completing its stroke in either direction is thus made so to act upon the valves as to change that which was the exhaust side of the piston into the steam side, and the reverse.

A.D. 1874, January 31.—No. 404.

CHERRY, Henry, of Handsworth, in the county of Stafford, mechanical engineer.—"Improvements in "steam pumps."

The inventor places a loaded valve in the suction pipe for the purpose of producing a vacuum into which the exhaust steam is discharged. At the upper part of the condenser is a chamber which first receives the water raised and from which it passes through a loaded valve by which it is spread into a thin sheet and then falls into the condenser. A bell mouth pipe is situated in the axis of the condenser, the lower end of the said pipe leading to the pump. By this arrangement a quantity of water always remains in the condenser which effects the condensation of the steam when the steam pump is first started. Various arrangements are described for pressing the loaded valve to its seat.

The suction valves of steam pumps having condensers are made of thin sheet metal, dished or turned up at the rim, the extreme edge being turned down to form a lip. The valve seat is ribbed. A light valve capable of opening readily and of being rapidly closed by the action of a spring is thereto formed.

A.D. 1874, January 31.—No. 405.

GOULDING, William, of Leicester, agricultural implement maker.—" Improvements in the construction " of folding chairs or seats and tables; which improvements are applicable to other articles of furniture " and utility."

For this purpose a cross frame is employed as heretofore, but instead of connecting the upper ends thereof together by means of a top formed of webbing they are connected together by a suitable arrangement of links carrying cross pieces to form the top, so that the top will fold in half and thereby allow of the cross frames being brought close together, by which means the article of furniture is rendered compact for transport.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 25 to July 31, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, February 2.—No. 406.

READ, **George**, of the town of Leicester, mineral water manufacturer.—“ Improvements in stoppers for “ bottles to contain aerated liquids.”

This invention consists in employing a metal plug or compound plug, which is inserted in the bottle or other vessel, and then encased in a capsule of india rubber or similar material, the open end of which being of thicker substance than the remainder contracts, and partly covers the broad end of the plug which is inserted within it, when inside the bottle or vessel by means of a looped wire and a straight wire, the plug and capsule then being of greater diameter than the orifice to be closed.

A.D. 1874, February 2.—No. 420.

JOHNSON, **John Henry**, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Charles Nicolas Plantrou, of Paris, in the Republic of France, spinner.*)—“ Improve-“ ments in machinery for carding, combing, and cleaning cotton, and other fibrous substances.”

This invention relates to certain improvements in the machinery for carding, combing, and cleaning cotton and other fibrous substances, for which Letters Patent were granted to Charles Nicolas Plantrou, the communicator of the present invention, bearing date August 2nd, 1866, No. 1988, and has for its object to render such machinery more practicable and advantageous, and to enable the various operations to be performed with greater facility than heretofore.

A.D. 1874, February 2.—No. 423.

LAKE, **William Robert**, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Donald D. Cattanach, of Providence, Rhode Island, United States of America.*)—“ Improvements in the manufacture of gum and gum-like substances from linseed oil and other “ similar oils.”

This invention consists in the manufacture of a gum or gum like substance from linseed oil or kindred oils by a process of treatment involving mainly the exposure of the oil to air and light, accompanied by frequent and continued agitation or stirring of the oil during such exposure, with or without a preliminary purification of the oil so treated.

A.D. 1874, February 3.—No. 424.

BECK, **William**, and STRONG, **William**, both of Barrow in Furness, in the county of Lancaster, mechanics.—“ Certain improvements in machinery for making bricks.”

This invention relates, first, to the construction of rotating mould boxes for brick making machines.

Secondly. To an arrangement for regulating and controlling the motion of rotatory mould boxes used in brick making machines; and Thirdly, to a mode of preventing the adhesion of clay or mould to the moveable base of mould boxes used in brick making machines.

A.D. 1874, February 3.—No. 425.

LOWE, Charles, of Reddish, in the county of Lancaster, manufacturing chemist.—" Improvements in " the separation and utilisation of certain mixed chemical products."

To carry out the object of this invention I take the dilute acid liquors containing sulphuric acid and picric acid obtained in the manufacture of picric acid as a lye product and concentrate the said dilute acid liquors by rectification in any suitable vessel or vessels.

A.D. 1874, February 3.—No. 428.

SIEMENS, Charles William, of No. 3, Great George Street, Westminster, in the county of Middlesex. —" Improvements in the treatment of puddled balls, and apparatus therefor."

This invention relates to shingling and compressing puddled balls and to the construction and operation of apparatus for that purpose.

The ball is placed on a turntable and subjected to the pressure of three or more hydraulic rams advanced simultaneously towards it horizontally in radial directions. The pressure being relieved and the rams withdrawn by counterweights or springs, the turntable is partly turned so as to present fresh portions of the ball to the rams which are again advanced. When the ball has thus been squeezed all round, a ram or screw head is brought to bear on it vertically and the rams are advanced with a higher degree of pressure, after which the consolidated metallic mass is withdrawn to be rolled, hammered, or converted into steel.

To economize power, two sources of hydraulic pressure are employed, the one giving a low pressure for the first part of the operation, and the other a much higher pressure for completing it.

Instead of using a number of separate hydraulic cylinders, the several pressure heads may be worked from one hydraulic cylinder, or by steam or other power.

A.D. 1874, February 3.—No. 429.

STEVENS, William, of St. Giles' Street, Northampton, in the county of Northampton.—" Improvements " in the manufacture of heels for boots or shoes, and apparatus therefor."

This invention relates to improvements in the construction and operation of apparatus of a kind similar to that described in a Provisional Specification filed by the said Wm. Stevens on the 27th September 1873, No. 3155.

A number of lifts or slabs, or pieces of leather or other material are held on a face plate by means of sliding dogs, and while so held are subjected to the pressure of dies hinged to the face plate, such dies having in them holes charged with nails or rivets, with plungers to force the nails or rivets into the materials of the heel.

A.D. 1874, February 3.—No. 435.

GIBSON, William, of Birmingham, in the county of Warwick, machinist.—" Improvements in castors " for furniture and other articles."

This invention consists of the following improvements in connecting the horn of the castor to the socket or plate, and in securing the castor to the leg or pillar of the furniture or other article. For connecting the horn to the socket or plate, a screw box on the flat bridge or top of the horn takes into an axial hole in the socket or plate. A screw peg having a broad flat head is screwed from the inside into the said screw box, its projecting end being rivetted to the underside of the bridge part of the horn. In this way the horn is connected to the castor by a swivel joint, the broad head of the screw peg seating itself firmly upon a circular seat in the head of the axial hole in the castor socket or plate. For securing the castor to the leg or pillar of the furniture or article ears or portions of a ring are made on the extreme upper edge of the socket or plate, tapped holes being formed in the said ears. By passing screw pins through these holes in the ears the castor is securely fastened in its place.

A.D. 1874, February 4.—No. 443.

HAMILTON, James Baillie, of University College, Oxford, esquire, and GOUVERNEUR, Jules, of 24, Stebbington Street, Oakley Square, in the county of Middlesex, reed manufacturer.—" Improvements " in the construction of musical instruments."

A new mode of combining a free reed and string, in which the contact of reed and string is intermittent instead of constant.

A.D. 1874, February 4.—No. 445.

NORTHCOTE, **George Barons**, junior, of Feniton Rectory, in the parish of Feniton, in the county of Devon, civil engineer.—" Improvements in apparatus for scraping or cleaning boots."

The novelty of the invention for improvements in apparatus for scraping or cleaning boots consists in arranging the apparatus in such a manner that when the boot or shoe is placed in proper position and drawn through it, side scrapers or cleaners press on the two sides of the boot or shoe at once, thereby scraping or cleaning the sides, and at the same time the sole may be scraped or cleaned.

A.D. 1874, February 17.—No. 594.

JOHNSON, **John Henry**, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Joseph Hirsch, of Paris, in the Republic of France, engineer.*)—" Improvements in the production and in the application of heated air, and in the machinery or apparatus employed therein."

This invention has for its object the utilization of the dynamic and calorific properties of heated air, and consists essentially in effecting the graduated combustion of liquid or gaseous fuel in a receptacle composed of refractory material, heated to a red heat, and containing air, the temperature of which it is required to raise by the ignition of the liquid or gaseous fuel injected therein, and in causing the heated air thus produced to pass through a heat regenerator, composed of small elements of a refractory material, presenting under the form of small spaces a large contact surface and a considerable total section for the passage of the fluid.

The invention is applicable to motive power engines, to the generation and accumulation of pressure, and to the production of hot blast.

A.D. 1874, February 20.—No. 649.

BAGEAU, **Henry Louis**, of Paris, Rue Bichat, No. 33, manufacturer.—" An improved waterproof compound for sizing and coating leather, wood, cloths, or other articles."

This compound consists of india rubber, gutta percha, resin, white lead, and essence.

A.D. 1874, February 21.—No. 658.

JOHNSON, **John Henry**, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Augustin Harmignies, engineer, of Paris, in the Republic of France.*)—" Improvements in steam engines."

This invention relates to apparatus to be applied to locomotive and other steam engines for the purpose of preventing the suction of air through the blast pipe or pipes when the engine is reversed, and consists in closing such blast pipe or pipes by means of a slide or damper provided with a spring valve, which slide or damper is brought into action when desired by the motion of a lever or otherwise so as to admit of the escape of any excess of pressure which may occur underneath it whilst at the same time excluding air.

A cock for the supply of cold water to the pipe or pipes is provided in combination with this apparatus, such cock being operated automatically through a rod or otherwise by the lever or other means employed for adjusting the position of the slide or damper.

A.D. 1874, February 24.—No. 689.

HEATON, **Charles**, of New York, United States of America, at present residing at 22, Craven Street, Strand, London.—" Certain improvements in emery and other grinding machinery, and in emery or other grinding wheels for use therewith."

The features of novelty consist in a device applicable to emery wheels or grindstones, which enables them to be run safely at extraordinarily high speed, and counteracts the tendency to burst from or by centrifugal force, and while it enables the emery wheel or stone to be thus run, also prevents its wearing out of truth, or round, counteracts the tendency to jump or run irregularly now existing, and while it permits the wheel or stone to grind or cut the material acted upon and to wear away in so doing, it yet enables the same surface-peed to be maintained until the stone or wheel is worn out.

It further consists in a device by means of which drills, chisels, or other tools may be accurately ground o the shape or angle desired; and in certain automatic mechanism which allows the tool-to-be-ground to be pplied to the wheel or stone, either moving towards the work or from it, as desired.

It further consists in a device or mechanical arrangement which enables large wheels or grindstones to be easily and practically operated, removed, or renewed when worn out.

The device is applicable to emery grinding machinery as now made, and may be applied to emery wheels or grindstones as now made or produced.

A.D. 1874, March 3.—No. 773.

SOUCHARD, Sosthène Hugues, of the firm Lemaire et Souchard, of Rue de la Cerisaie, 41, at Paris, manufacturers.—" Improvements in lamps and in apparatus connected therewith."

This invention relates to the construction of a lamp which by the adjustment or changing of certain of its component parts is rendered applicable to a variety of purposes. When used in combination with reflectors it is provided with a wick tube of triangular shape, which is replaced by an ordinary wick tube when the lamp is used for ordinary illuminating purposes. The reflectors are carried on a stem which can be unscrewed from the body of the lamp. The gallery is provided with upper and lower apertures with slides for regulating the internal and external air supply. When the lamp is to be transported the gallery and wick tube are removed and the oil lamp is closed by a screw cap. The support for the globe or receptacle containing the object to be reflected is rendered adjustable on the gallery by a rack and pinion, and the keys for adjusting this support and the wick are provided with hinge joints so that they can be turned down in order to occupy less space in transporting the lamp. A collar with candlestick branches projecting from it may be placed on the neck of the lamp so as to form a gerandole.

A.D. 1874, March 25.—No. 1039.

VAN WAEYENBERCH, Alfred, of Ath, in the Kingdom of Belgium, constructing engineer.—" A new " or improved method of distributing steam and obtaining variable expansion through the agency of " governors in steam-engines."

This invention relates to a means of almost entirely obviating the detrimental spaces which are so great a cause of loss in the cylinders of steam engines by effecting the distribution of steam on both sides of the cylinder, using two or more steam valves and exhaust slide-valves juxtaposed so as to make each communicate at the end of the cylinder by the same port.

The steam is admitted and the duration of its introduction directly regulated by the governor, according to the work to be done by the machine.

For this purpose the shaft of the levers actuating the steam inlet valves forms part of a slotted sector furnished with a click and spring work, rendering it at a given moment independent of the slides and the connecting rods of the transmission of movement. When this moment arrives, the port that was open instantly closes, and the introduction of steam being stopped, the steams acts by expansion in the cylinder until the piston has completed its stroke. Then the exhaust valves open a passage for the steam either into another cylinder, into the atmosphere, or into the condenser, according to requirement.

A.D. 1874, July 25.—No. 2606.

WIRTH, Frank, of the firm of Wirth and Company, patent agency, of Frankfort on the Maine, in the Empire of Germany.—(*A communication from Eugen Langen, a person residing at Cologne, on the Rhine, in the Empire of Germany.*)—" Improvements in the process of 'claying' or refining loaves of sugar, " and in the apparatus or appliances employed therein."

The novelty in this case consists in claying or refining loaves of sugar by forcing, with hydraulic or other pressure, the claying liquor from below upwards into the sugar, and in thus refining a number of sugar loaves simultaneously and expeditiously.

A.D. 1874, July 28.—No. 2629.

BREWER, Edward Griffith, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from James Potter McLean, of Brooklyn, New York, in the United States of America.*)—" Improvements in clasps " for corsets, corselets, or stays."

The novelty of this invention consists in the construction of wire busks or clasps, to be used in lieu of the well known flat steel clasps of commerce for uniting corsets or stays, the hooks and eyes or loops being formed of the same piece of wire as the body of the clasp itself.

A.D. 1874, July 28.—No. 2640.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Francis Roach, of Boston, Massachusetts, United States of America.*)— "Improvements in faucets."

This invention relates to faucets and to arranging the following parts with each other, namely, first, a water way for induction, having a valve seat near its inner end or upon it. Second, a valve closing upon the valve seat against the pressure of the water. Third, a spring of greater power than the water pressure and pressing towards or upon the valve seat the said valve. Fourth, a water way connected in one channel with the induction water way spoken of, for delivery of the water. Fifth, a rotating key, having an internal formation which, in combination with the formation of the cap of the faucet against which the key abuts, compels said key to clinch upon the suck of the faucet as it rotates. Sixth, a connection between the key and valve, which obliges the key to do the work of lifting the valve; and the spring to do the work of returning the valve to its seat.

A.D. 1874, July 29.—No. 2646.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Elisha Gray, of Chicago, county of Cook, state of Illinois, United States of America.*)— "Improvements in the method of and apparatus for transmitting musical tones by electricity."

This invention relates to a method of producing musical tones of any desired pitch at any point in an electrical circuit, and consists in transmitting a series of impulses of induced electricity of high tension, corresponding in number to the number of audible vibrations constituting said musical tone, through living tissue in contact with any resonant substance, or through a coil surrounding a bar of iron or the core of an electro magnet, the succession of currents being produced by an induction coil or other apparatus for inducing a secondary current, and being caused by the action of any suitable circuit interrupter situated in a primary circuit.

A.D. 1874, July 29.—No. 2647.

DAVILLE, Robert Samuel, of 75, Great George Street, Liverpool.—(*A communication from George Webster and John Frazer Webster, both of the city of Hamilton, Ontario, in the Dominion of Canada.*)—"Improvements in sewing machines."

The claims to this Complete Specification are—

1st. In the needle bar N having an even uniform motion without stop or rest on its upward or downward movement produced by the driving shaft H acting upon the eccentric A^1, connecting rod F, and needle bar arm U, in combination with a uniform motion of the shuttle forming a perfect double thread lock stitch.

2nd. In the arrangement of an adjustable shuttle race composed of round wires *b b*, placed in the slots P P, and adjusted by the set screws b^1 b^1 b^{11} b^{11}, substantially as and for the purpose specified.

3rd. In the arrangement of the pivoted lever I, provided with a ball and socket joint driving the shuttle carrier J by a crank, as shewn in Figure 2, or its equivalent, substantially as and for the purpose specified.

4th. In a positive thread take up produced by the needle arm U, arm levers *i d j*, shank and disc L *k*, in combination with a regular or even motion needle bar.

A.D. 1874, July 29.—No. 2650.

WISE, William Lloyd, of Chandos Chambers, Adelphi, in the county of Middlesex, patent agent.—(*A communication from Henri François Lafaurie, employè, and Henri Firmin Eugène Potel, employè, both of Paris, in the Republic of France.*)—"Improvements in lamps for burning petroleum and other mineral oils."

This invention relates to :—

1st. An improved arrangement of lamps in which are combined the employment of a wick of considerable section, of an elongated burner, of a moveable glass carrying gallery surrounding all the parts of the burner, of a cap of special form giving an elongated flame, of straight glasses of the kind called "omnibus," of a globe carrying register turning on the gallery, and of a fixing ring capable of being separated from the burner screw, and swollen or beaded at the bottom.

2ndly. A special arrangement of petroleum or mineral oil lamp for the lighting of railway rolling stock, in which are combined a reflector resting on the glass vessel and retaining in place the lamp which rests on three brass rods or supports, an additional reflector directing the luminous rays so as to suppress the conical shadow of the reservoir, and an improved system of burner.

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———*E.*(Lake), 1421 (*App.* 4.) Rotating shaft indicators.
——— *J. R.* (Miller), 98, Rendering, purifying and [bleaching fatty matters.
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Browne, A. (*Knapp*), 66, Raising sunken vessels.
——— (*Foundries & Forges Co.*), 220, Converting iron [scraps into steel.
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Chalumet, G. (Mewburn), 156, Textile fabrics.
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——— (*Sawyer*), 253, Electric telegraphs.
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——— (*Bliss*), 2366 (*App.* 2.) Making soap bubbles.
——— (*Universal Signal Light Co.*), 2390 (*App.* 2.) [Signal lanterns.
——— (*Miltimore, Phillips & Morris*) 2498 (*App.* 3.) [Railway carriage axles.
——— (*Atkinson*), 2563 (*App.* 4.) Steam pumps.
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——— J., 204, Waterproof garments.
——— J. L., & Standfield, J., 111, Floating docks and [pontoons.
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[bonnets, caps or hats.
(*Williams & Page*), 24, Lamps.

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[blasting.
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(Ray), 100, Producing optical illusions.
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e, E. L. J. E. (Bousfield), 2388 (*App.* 2.) Pro-
[pelling ships.
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re, A. (Bonneville), 683 (*App.* 35.) Wiring
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[of writings, &c.
H., 163, Treating impregnated porous sub-
[stances employed in effecting chemical
[decomposition of gases.
, *Smith, W. H., & Merrell, H.* (Haseltine), 2001
[(*App.* 50.) Dressing millstones.
, R., 397, Saving fuel and consuming smoke.
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e, N. A., 56, Corkscrews.
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, A., 20, Utilizing heat of furnaces.
22, Peat-fuel.
, *G., & George, C. B.* (Haseltine), 2475 (*App.* 3.)
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[buses, &c.
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——— 232, Purifying gas.
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Gedge, W. E. (*Cornely*), 107, Embroidering machines.
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Goodwin, C. R. (Clark), 364, Cutting button holes.
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Harling, G., & Whiteley, W., 244, Looms for weaving.
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—— (*McGhee & Risher*), 807 (*App.* 36.) Steam- [engines.
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—— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep [shears.
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——— (*Mousseron*), 73, Warming railway carriages.
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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 31, 1874, and to Appendixes from February 1 to July 31, 1874.

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CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 1 to February 7, 1874.

A.D. 1874, February 2.—No. 406.

AD, **GEORGE**, of the town of Leicester, mineral water manufacturer.—" Improvements in stoppers for
ottles to contain aerated liquids."

his invention consists in employing a metal plug or compound plug, which is inserted in the bottle or
er vessel, and then encased in a capsule of india rubber or similar material, the open end of which being
hicker substance than the remainder, contracts and partly covers the broad end of the plug which is
erted within it, when inside the bottle or vessel by means of a looped wire and a straight wire, the plug
capsule then being of greater diameter than the orifice to be closed.

A.D. 1874, February 2.—No. 407.

AMP, **CHARLES COURTNEY**, of 87, Litchfield Rd., Grove Rd., Bow, in the county of Middlesex,
ineer—" Improvements in apparatuses applied to tramways, parts of which may be used for other
urposes."

he novelties of these inventions consists of, in the first place, the unlimited power that may be applied
causing the brake blocks to grip both sides of the wheel.

n the second form of brake, the ease with which the car may be made to use up its own energy in
rcoming it.

he destination boards will prove of great utility at stations or termini where cars are started for different
tes, making it apparent to the passengers the right car is entered.

n the case of the reflector, the lamp being fixed in the centre of the carriage, all the rays of light are
d and most effectually. The cutting of the mirrow into facets will ensure the bull's eyes being seen at
angle, while the position of the lamp in the car will prevent accidents from rain or wind.

A.D. 1874, February 2.—No. 408.

ACK, **WILLIAM YOUNG**, of Borgue, in the county of Kirkcudbright, North Britain, road surveyor.—
mprovements in switches for railways."

This invention substantially consists in the construction and use of substitution separate rails for each
e at the points of their junction, on opposite sides of a strong revolving or oscillating plate or bar, so as to
used alternately as required by the joint or simultaneous oscillation or rotation of the pair of plates, by
ains or wire ropes, attached to and wound in different directions round the axis of these plates, preferably
both ends, or by other equivalent means, such as toothed pinions and straight or segmental reciprocating
cks, which reciprocating chains or racks would be actuated by a single tilting counter weighted lever
ich would oscillate and retain the plates in either of their tilted positions, thus bringing the respective
ir of rails pertaining to the separate lines into proper position or line to form a connection with and con-
itute the required line desired to be open for traffic, all otherwise in a usual manner, all instead of and in
ntradistinction to the lateral shifting rail or point switches at present in use.

A.D. 1874, February 2.—No. 409.

DDLETON, **EMPSON EDWARD**, bachelor and gentleman, residing at No. 9, Anglesea Place, South-
pton, in the county of Hampshire.—" An improved method of building and altering by lengthening by
he stern, the after hull of yacht, sailing boat, or other vessel."

he novelty of this invention consists in carrying the stern post aft from or by the *lower end*, the deck end
he stern post being the pivot end; and further, by carrying out the keel or lengthening the keel to such
ent aft that the keel shall meet the new line of inclined stern post. The importance of this invention

can hardly be over estimated. I consider it one of those inventions which are great boons to the world at large, for I expect it to tend directly to an immense saving in coals, by causing sailing vessels to be more generally used on account of their *greatly accelerated speed*. The recommendations will be gone into in the final Specification.

A.D. 1874, February 2.—No. 410.

WICHMANN, Carl, of Liverpool, in the county of Lancaster.—(*A communication to him from James Patterson, of Hornellsville, New York, United States of America.*)—" An improved elastic steel railway 'frog' " for crossings."

A railway " frog " constructed according to this invention consists of a thick rolled iron bed plate mounted on an oak or suitable plank. A point or tongue of solid cast steel, the back of which is made hollow with heel rails drilled for fish plate attachments, is held to the bed plate by two lugs which are let into suitable openings in the bed plate to receive them, and are fastened thereto by two transverse keys passing under the bed plate and through the lugs; by simply driving out the keys the point can be readily removed, and it can also be replaced with equal facility. Two steel wing rails drilled for fish plate attachments are held on the bed plate by lips in a chair or clamp passing under the bed plate and projecting through openings so as to receive the rails, which are further secured and held to the bed plate by flanges on the " frog " point.

A.D. 1874, February 2.—No. 411.

STANLEY, William Ford, of 5, Great Turnstile, Holborn, London.—" An improved circular saw " bench."

The improvement consists in means of raising the top of a circular bench, keeping it at the same time level, the saw being stationary. The means consist of introducing a frame which is constructed to carry three or more wedges, cams, or levels between the top of the saw bench and the stand, so that the top may be adjusted to height by drawing the wedge frame towards one side of the stand by a screw.

A.D. 1874, February 2.—No. 412.

STANLEY, William Ford, of Great Turnstile, Holborn, London.—" Improved points for mathematical " drawing instruments."

Improved points for mathematical drawing instruments, consist in making the point of steel wire which is inserted in a groove up the inside of the leg of the compasses and soldered therein.

A.D. 1874, February 2.—No. 413.

DAVIES, Isaac, of Britonferry, in the county of Glamorgan, engineer.—" A new or improved machine for " opening or separating plates of iron known as 'black plate,' after leaving the black plate mill."

The Specification of this invention describes a machine for separating " black plate." This is effected by passing the bundles of black plate through between pairs of fluted and straight rollers, such rollers being geared by toothed wheels attached to the alternate roller of each pair.

A.D. 1874, February 2.—No. 414.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex. —(*A communication by Gottlieb Wilhelm Daimler, of Muelheim on the Rhine, in the German Empire, civil engineer.*)—" Improvements in gas-motor engines."

This invention relates to improvements in gas motor engines of the kind described in the Specons. of Patents, Nos. 434 of 1866, and 2245 of 1867.

They consist chiefly in the construction and arrangement of a crank and levers and rods connected thereto for working the slide and for partly moving the piston, such crank being either moved by the engine shaft or left at rest according as a pawl mounted on it is engaged with or disengaged from a ratchet wheel on the engine shaft. The engaging and disengaging of the pawl is effected by the movement of the piston in its descent and ascent, and is also controlled by a governor in such manner that when the engine shaft is revolving with sufficient speed the expenditure of gas is stopped.

The slide is arranged for the admission of the combustible gaseous mixture, and of an igniting flame to the cylinder, and for the emission of the products of combustion from the cylinder by one and the same passage.

A.D. 1874, February 2.—No. 415.

ARCHANT, John, of No. 10, Dagmar Road, Camberwell, in the county of Surrey.—" Improvements in guard or safety signals for railway points or switches."

This invention relates to means of signalling to a pointsman the passage of a train over points distant om or invisible to him, so as to forbid his shifting the points while the train is passing over them.

A counterweighted or spring trigger or slide is mounted close to the points so as to be acted on by assing wheels causing it to make and break contact with an electric wire leading to a visible or audible ectric signal in the signal box. The action of this signal informs the pointsman in the box that the train passing the points, and he is thus warned against moving the points till the action of the signal ceases, e last wheel of the train having passed it.

A.D. 1874, February 2.—No. 416.

ICHARD, Louis Miroude, of Rouen (France), manufacturer.—" Improvements in saw teeth for carding engines."

This consists in forming the saw teeth of cards with an inclined notch, the inclination of which commences mmediately below the point of the tooth, so that whatever may be the tension placed upon the tooth the nclination of the notch is never lost.

A.D. 1874, February 2.—No. 417.

COOPER, Charles, of Clapham, in the county of Surrey, gentleman.—" An improved mode of working " the points of railways."

This invention consists of a device to allow the engine driver to open and shut the points without the ssistance of any of the attendants on the line. For this purpose the engine carries a wheel which is capable f being raised or lowered, and when lowered it will (as the engine advances) be made to run over the upper ace of a treadle lever and thereby depress it so that the points in advance will be shifted ready to shunt the rain into the siding.

A.D. 1874, February 2.—No. 418.

EWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, ivil engineer.—(*A communication from William X. Stevens, of East Brookfield, in the county of Worcester, nd state of Massachusetts, in the United States of America.*)—" Improvements in shears for cutting bars or " rods of iron and other metal or material."

The more particular object of this invention is to shear off iron or other metal bars or rods of large dimensions in their transverse sections, and to shear or cut with facility metal bars of smaller dimensions. To these ends the invention consists of a combination (in a pair of shears) of dies or shearing edges held respectively in separate arms or levers.

A.D. 1874, February 2.—No. 419.

WALTON, Frederick Arthur, of Birmingham, in the county of Warwick, manufacturing jeweller.— "Improvements in fastenings for wearing apparel."

This invention consists in forming a back plate of metal or other suitable material to studs, brooches, and similar articles, upon which plate is fastened a piece of wire or flat metal bent into a bow shape, so that when the ends of the wire are pressed it will act as a spring and hold firmly any suitable catch upon the other portion of the article.

A.D. 1874, February 2.—No. 420.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Charles Nicolas Plantrou, of Paris, in the Republic of France, spinner.*)—" Improvements in machinery for carding, combing, and cleaning cotton, and other fibrous substances."

This invention relates to certain improvements in the machinery for carding, combing, and cleaning cotton and other fibrous substances, for which Letters Patent were granted to Charles Nicolas Plantrou, the communicator of the present invention, bearing date August 2nd, 1866, No. 1988, and has for its object to render such machinery more practicable and advantageous, and to enable the various operations to be performed with greater facility than heretofore.

A.D. 1874, February 2.—No. 421.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from John Gschwind, of the town of Union, and Charles Beberdick, of the city of Hoboken, both in the county of Hudson, and state of New Jersey, United States of America.*)—" An improvement in the " manufacture of embossed gilt and silver mouldings."

The improvement in embossing mouldings consists in first protecting the plaster by applying the gold or silver foil, and then embossing both foil and plaster at the same time by means of pressure.

A.D. 1874, February 2.—No. 422.

BROWNE, ALEXANDER, of the firm of Browne and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—(*A communication from The Foundries and Forges Company, of Terre Noire, La Voulte, and Bessèges, in the French Republic.*)—" Improvements in the manufacture of alloys of " iron."

The features of novelty of this invention consist of improvements in the manufacture and treatment of alloys of iron with manganese, tungsten, titanium, silicium, and other like substances; and is comprised under the following heads :—

First. In methods of preliminary treatment of the materials used by combining them previous to the operation of smelting.

Second. In the adoption of specific proportions of materials with a view to the production of definite alloy.

Third. In collecting the alloy thus produced in the most economical manner; and this is accomplished by a double process, that is to say—

First. Rendering the slag or cinder perfectly fluid.

Second. By subsequent additions of metals or alloys to cause an union of the scattered portions into one mass.

To fully understand the whole course of the operation it is necessary to refer to the Specification.

A.D. 1874, February 2.—No. 423.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Donald D. Cattanach, of Providence, Rhode Island, United States of America.*)—" Improvements in the manufacture of gum and gum-like substances from linseed oil and other " similar oils."

This invention consists in the manufacture of a gum or gum like substance from linseed oil or kindred oils by a process of treatment involving mainly the exposure of the oil to air and light, accompanied by frequent and continued agitation or stirring of the oil during such exposure, with or without a preliminary purification of the oil so treated.

A.D. 1874, February 3.—No. 424.

BECK, WILLIAM, and STRONG, WILLIAM, both of Barrow in Furness, in the county of Lancaster, mechanics.—" Certain improvements in machinery for making bricks."

This invention relates, first, to the construction of rotating mould boxes for brick making machines.

Secondly. To an arrangement for regulating and controlling the motion of rotatory mould boxes used in brick making machines; and Thirdly, to a mode of preventing the adhesion of clay or mould to the moveable base of mould boxes used in brick making machines.

A.D. 1874, February 3.—No. 425.

LOWE, CHARLES, of Reddish, in the county of Lancaster, manufacturing chemist.—" Improvements in " the separation and utilisation of certain mixed chemical products."

To carry out the object of this invention I take the dilute acid liquors containing sulphuric acid and picric acid obtained in the manufacture of picric acid as a lye product; and concentrate the said dilute acid liquors by rectification in any suitable vessel or vessels.

A.D. 1874, February 3.—No. 426.

, Martin, of No. 9, Southampton Buildings, London.—(*A communication from Franklin Theo-*
ruson, of Boston, state of Massachusetts, United States of North America.)—" Improvements in
gs and cutters."
rovement consists in the manner of constructing and adjusting the fans of the tongs for any size
initing or screwing them together or apart, and also constructing the tongs for cutting pipes of
ed size.

A.D. 1874, February 3.—No. 427.

Edward, of Middlesbrough, in the county of York, and WILSON, Alfred, of Middlesbro',
nty of York.—" An improved mode of consuming fuel in furnaces for raising steam, and in other
aces."
ention has for its object an improved mode of consuming fuel for raising steam and other pur-
relates to the heating of generators for raising steam by the use of fuel on a solid hearth, such
supplied with air previously heated in suitable apparatus by the waste products of combustion
y the flues.
its application in furnaces for raising steam as above described, this mode of consuming fuel may
other like furnaces.

A.D. 1874, February 3.—No. 428.

S, Charles William, of No. 3, Great George Street, Westminster, in the county of Middlesex.
vements in the treatment of puddled balls, and apparatus therefor."
ention relates to shingling and compressing puddled balls and to the construction and operation
us for that purpose.
l is placed on a turntable and subjected to the pressure of three or more hydraulic rams advanced
ously towards it horizontally in radial directions. The pressure being relieved and the rams with-
counterweights or springs, the turntable is partly turned so as to present fresh portions of the ball
ns which are again advanced. When the ball has thus been squeezed all round, a ram or screw
rought to bear on it vertically and the rams are advanced with a higher degree of pressure, after
consolidated metallic mass is withdrawn to be rolled, hammered, or converted into steel.
omize power, two sources of hydraulic pressure are employed, the one giving a low pressure for the
of the operation, and the other a much higher pressure for completing it.
of using a number of separate hydraulic cylinders, the several pressure heads may be worked from
ulic cylinder, or by steam or other power.

A.D. 1874, February 3.—No. 429.

S, William, of St. Giles' Street, Northampton, in the county of Northampton.—" Improvements
nanufacture of heels for boots or shoes, and apparatus therefor."
ention relates to improvements in the construction and operation of apparatus of a kind similar to
ibed in a Provisional Specification filed by the said Wm. Stevens on the 27th September 1873,

er of lifts or slabs, or pieces of leather or other material are held on a face plate by means of
gs, and while so held are subjected to the pressure of dies hinged to the face plate, such dies
them holes charged with nails or rivets, with plungers to force the nails or rivets into the materials
l.

A.D. 1874, February 3.—No. 430.

TER, Charles, 48, Oxford St., London, W.—(*A communication from François Lenoir, 37, Rue*
x-belles, Paris.)—" A new hydro-carbone purificatory apparatus for the illuminating gas."
ention consists in a complete purification of illuminating gas by a carburatory process. Being
y simple, it offers great advantages for common use, as it does not require any absorbent or
terial, cotton, or pumice stone, to effect the carburation, the carburating fluid being in direct
th the gas to be purified. The apparatus differs entirely with all those used until now without
s. The gas enters at one end of the apparatus, in the inside of which it follows a regulated

motion, by passing through partitions, which are perforated alternately on opposite sides of the chamber, compelling the gas to take a serpentine course over a liquid hydro-carbure bath, and it makes its exit from it saturated with the volatile particles of the fluid. The successive supply of the liquid is effected by a mariotte pipe or flask with a branch leading to a chamber above. Another valuable feature is the facility of expelling, in due time, the heavy products accumulating at the bottom of the carburating chamber. By referring to plans annexed to this petition, the apparatus and his functions may be soon explained.

A.D. 1874, February 3.—No. 431.

DENNIS, Thomas Hungate Preston, of Chelmsford, in the county of Essex, horticultural engineer.—"A new or improved water waste preventor."

My invention consists of a cistern having two compartments, the one for receiving the direct supply of water from the main or other source through an ordinary ball valve, the other or service boot for containing any requisite flush of water that may be desired. A small hole in the partition connects the water supply to the two compartments. The water is supplied from service boot to service pipe by means of a syphon, having a plunging disc or plate so fitted round its short leg, that upon giving motion to the same by means of a suitable lever, &c., the whole contents of service boot, or only a portion thereof may be discharged into the service pipe at pleasure, whilst, certain arrangements hereafter to be more minutely described, no more water than the cistern is arranged to get at one flush can possibly be obtained.

A.D. 1874, February 3.—No. 432.

HYATT, Thaddeus, of Gloucester Gardens, Hyde Park, in the county of Middlesex.—"Improvements in "carriage and foot-ways."

This invention consists of an improved roadway made up of three principal parts or elements. First, a permanent substructure; second, a road surface; and third, a renewable wearing surface; the permanent substructure consisting of heavy timber paved together so as to be readily taken apart in sections; the road surface consisting of timber in sections or squares resting upon the foundation timbers; and the renewable wearing surface consisting of any suitable materials capable of being readily attached to the road surface, this wearing surface being roughened to prevent animals from slipping upon it.

A.D. 1874, February 3.—No. 433.

BREWER, Edward Griffith, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from Romain Joly, of Caudebec-lès-Elbeuf, France.*)—"The incineration of mixed vegetable substances "from wools or woollen fabrics by the application and manufacture of chloride or chlorate salts, preferably "of zinc, magnesium and aluminium, applicable to unbleached and dyed or coloured materials."

This invention consists in the incineration of vegetable matters contained in wool or woollen fabrics by means of chlorides or chlorates of zinc, magnesium, and aluminium; and in the manufacture of the latter product.

A.D. 1874, February 3.—No. 434.

LEONARDT, Friedrich, of Birmingham, in the county of Warwick, manufacturer, and GILBERT, William, of Birmingham aforesaid, stamper and piercer.—"Improvements in boxes or receptacles for "holding pens, buttons, needles, and other small articles, and for other purposes."

One part of this invention consists in combining with boxes or receptacles for holding pens, buttons, and other articles, means for exhibiting a sample or pattern of the articles contained in the box. For this purpose a small chamber is either hinged or fixed to the end, side, or top or lid of the box, in which chamber the pattern pen or button is placed. The pattern is seen through the glass front of the chamber, and the said pattern is protected from dust and the action of the atmosphere. Or the same object is attained by making the closed end of the case in which the box slides of glass, and affixing the pattern pen or article to the end of the box.

Another part consists in making metallic boxes or receptacles capable of being readily moved on a table or other surface. To this end the box or receptacle has the general figure of a wheelbarrow, and is either open at top or closed by a hinged plate or case.

The body of the box is made from one piece of sheet metal and the sides from separate pieces, the parts being connected together by ears passed through piercings and clinched.

The case, which may be jointed to the top of the box, may be used for holding needles and other small articles.

A.D. 1874, February 3.—No. 435.

GIBSON, William, of Birmingham, in the county of Warwick, machinist.—"Improvements in castors "for furniture and other articles."

This invention consists of the following improvements in connecting the horn of the castor to the socket or plate, and in securing the castor to the leg or pillar of the furniture or other article. For connecting the horn to the socket or plate, a screw box on the flat bridge or top of the horn takes into an axial hole in the socket or plate. A screw peg having a broad flat head is screwed from the inside into the said screw box, its projecting end being rivetted to the underside of the bridge part of the horn. In this way the horn is connected to the castor by a swivel joint, the broad head of the screw peg seating itself firmly upon a circular seat in the head of the axial hole in the castor socket or plate. For securing the castor to the leg or pillar of the furniture or article, ears or portions of a ring are made on the extreme upper edge of the socket or plate, tapped holes being formed in the said ears. By passing screw pins through these holes in the ears the castor is securely fastened in its place.

A.D. 1874, February 3.—No. 436.

PICKUP, James, of Tong, near Bradford, in the county of York, engineer.—"Improvements in looms for "weaving."

This invention relates, firstly, to an improved means of controlling the warp beam during the "letting off" of yarn.

Secondly. The spiral springs used in connection with the working, the healds, picking shaft, and other parts of the loom, I mount on wires or rods passed through the interior thereof, and a ring is connected with the internal wires at each end of the spring by having the end of each wire curved over a cap or disc at each end of the spring.

Thirdly. In the use of india rubber buffer or check pieces mounted on the spindle of the shuttle box, so as to break the shock of the picker, and to prevent the throwing of grease and damaging with the check straps.

A.D. 1874, February 3.—No. 437.

SHUTTLEWORTH, John, of Keighley, in the county of York, foreman mechanic, in employ of Messrs. I. and I. Craven & Co., of Keighley, aforesaid.—"Improvements in looms for weaving."

This invention relates to the construction of the crank arms of looms in such manner as that wear and tear shall be compensated or adjusted by self acting means.

A.D. 1874, February 3.—No. 438.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent. —(*A communication from Robert McKinley, of Hyde Park, Dutchess county, and state of New York, United States of America.*)—"An improved implement for hoeing, path cutting, and raking."

This invention relates to a combined hoe or pathcutter and rotary rake, and is intended for application in making roads and paths, and in beautifying lawns, and for other similar purposes.

A.D. 1874, February 3.—No. 439.

HIGHTON, Henry, M.A., of Putney, in the county of Surrey..—"Improvements in electric telegraphs."

This Provisional Specification describes obviating "retardation" in telegraph cables.

At convenient places in the line, pairs of plates of metal or carbon are placed. These plates are arranged in the same manner as the plates in a galvanic battery, except that only one conducting liquid is used, and that the two plates in each pair are similar to each other.

A.D. 1874, February 3.—No. 440.

MACKIE, Samuel Joseph, of No. 3, Delahay Street, Great George Street, in the city of Westminster.— "Improvements in apparatus for signalling on railway trains."

This Provisional Specification describes a double electrical apparatus for signalling between the guards and passengers, by which an answering signal can be given and the carriage from which the signal originates be pointed out to the guards.

The apparatus signals to the guards if any of the couplings are imperfect.

Provision is made for connecting to a train of carriages fitted with the apparatus carriages which are not so fitted.

A.D. 1874, February 3.—No. 441.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Elisha Packer Wilbur, of Bethlehem, in the state of Pennsylvania, United States of America.*)—" Improvements in the manufacture of metal tubing."

This invention relates to a process of manufacturing metal tubing, including tubes of homogeneous iron and steel, by which a seamless tube is produced from a block having a passage formed through it, and which is afterwards shaped and drawn or reduced by external and internal pressure obtained in part by the action of rolls.

A.D. 1874, February 4.—No. 442.

WEBB, Francis William, of Crewe, in the county of Chester, engineer.—" Improvements in mechanism " or arrangements for actuating railway points and signals."

The invention relates to and consists in an improved combination, arrangement, and construction of mechanism for holding the point and signal levers and locking the same in their correct positions after having been moved. The locking mechanism is actuated by a lever having its fulcrum on the lever handle that actuates the point or signal, and movement from the said lever is transmitted to a catch weight sliding upon the lever handle, which catch weight enters notches in the quadrant. From the catch weight, and by another rod, the motion is transmitted to the ordinary notched bar for locking, either directly or through a short lever having its fulcrum on the lever handle.

A.D. 1874, February 4.—No. 443.

HAMILTON, James Baillie, of University College, Oxford, esquire, and GOUVERNEUR, Jules, of 24, Stebbington Street, Oakley Square, in the county of Middlesex, reed manufacturer.—" Improvements " in the construction of musical instruments."

A new mode of combining a free reed and string, in which the contact of reed and string is intermittent instead of constant.

A.D. 1874, February 4.—No. 444.

MAC CALLAN, George, of Johnstone, in the county of Renfrew, North Britain, gasfitter.—" Improvements in reflectors."

The feature of novelty which constitutes this invention is:

The arrangement of reflecting surfaces placed either at the central part of a " sunlight " reflector, or used apart from an ordinary " sunlight " reflector.

A.D. 1874, February 4.—No. 445.

NORTHCOTE, George Barons, junior, of Feniton Rectory, in the parish of Feniton, in the county of Devon, civil engineer.—" Improvements in apparatus for scraping or cleaning boots."

The novelty of the invention for improvements in apparatus for scraping or cleaning boots consists in arranging the apparatus in such a manner that, when the boot or shoe is placed in proper position and drawn through it, side scrapers or cleaners press on the two sides of the boot or shoe at once, thereby scraping or cleaning the sides, and at the same time the sole may be scraped or cleaned.

A.D. 1874, February 4.—No. 446.

HEAVEN, Alfred, of Manchester, in the county of Lancaster, embroiderer.—" Improvements in embroidering and ornamenting woven fabrics."

My invention consists in producing leaves, flowers, and other designs by means of narrow strips of paper or other material, which strips are passed through the machine known as Lindley and Taylor's edging machine. Or leaves or other designs can be produced on fabrics in the ordinary embroidering machine and then cut by hand or stamped into suitable forms, the edges of which are embroidered by the edging machine above referred to. Or long flowering patterns are embroidered in rows on fabrics on the ordinary embroidering machines, then cut into strips which are afterwards attached to table cloths or other fabrics by the edging machine above referred to.

A.D. 1874, February 4.—No. 447.

MACINTOSH, John, of Westminster, in the county of Middlesex, civil engineer.—" Improvements in " materials for insulating telegraphic wires, part of which material is also applicable to covering other sub- " stances and rendering them waterproof."

The objects of the first part of my invention are to lessen the expense of materials for insulating telegraphic wires; and consists of mixing cotton seed pitch with caoutchou until it becomes a hot plastic nitroginous mass, in which state it can be put on the wires by the machines used for that purpose.

The second parts of my invention are to lessen the expense of water-proofing other substances, and consists of in using cotton seed pitch alone or in combination with other materials, and can be put on to cloth in a plastic place by rollers, or dissolved by its solvents and spread with a brush on surfaces, and in some cases it may be vulcanised.

A.D. 1874, February 4.—No. 448.

HARGREAVES, James, of Widnes, in the county of Lancaster, chemist, and **ROBINSON, Thomas**, of the same place, iron founder.—" Improvements in and connected with the manufacture of sulphates of soda " and potassa, and in apparatus or appliances employed therein."

This consists of certain novel combinations and arrangements of parts whereby the manufacture of sulphates by the patentees' well known direct action process is facilitated and cheapened.

First. One of the uptake connecting pipes opens into a high level flue.

Second. A steam pump is used to draw the gases through the converting chambers. The capacities of the steam and pump cylinders are such that about one volume of steam is used for every ten volumes of gas exhausted. The exhaust steam is superheated and mixed with the sulphuric acid.

Third. Slide grids with a projection or projections fit hinge-like into a cavity or cavities on the back support and allow the grids to fall and the sulphates to be easily removed.

Fourth. The heated gases or products of combustion are caused to pass by a syphon from between the cylinder top and covering plate into the converting chamber, being filled thence down through an opening in the bottom plate of one of the drawing doors to a chimney. In this way the chloride in or being filled into a chamber is prevented from being damped by condensation, and is heated by direct contact with heated gases.

Fifth. The outsides of the side grids are made without perforations for from six to ten inches, so as to assist in forcing a stronger current of gas through the centre of the mass in a chamber.

Sixth. For condensing the hydrochloric acid evolved, an oblong tower connected to a set of tubular syphons is used. These syphons are connected with a second oblong tower, upon which is erected a wash tower to condense the last traces. The tower is built of specially formed acid resisting bricks or stones. Such bricks or stones form tubes, being rammed with a mixture of tar and clay, or other suitable material impermeable to acid.

Seventh. The converting chambers are each speedily filled from a hopper fitted with a sliding or removable shutter.

Eighth. The syphons connecting the flues and chambers are made in two pieces. The joints are made good by two plates, one with an aperture therein to allow the gas to pass when desired, and the other, without an aperture, to close the passage.

Ninth. An aperture is formed on the end of each of the syphons, which enter the converting chambers, and air admitted therethrough to cool the chambers should they be allowed to become too hot. The said aperture is provided with two covers so that by turning one, the area of inlet may be varied at pleasure.

Tenth. The chambers are built in two rows at a suitable distance apart, so as to allow drawing of sulphates from the chambers at both sides. The gases after passing through one of the rows of chambers are taken through a connecting pipe to the other row, and if necessary back by a second pipe to the first row.

Eleventh. To utilize waste heat from the sulphate apparatus, and provide means for drying the chloride into hard lumps, we place iron plates with flue spaces beneath them on the top of the arch between the two rows of chambers described under the tenth head.

A.D. 1874, February 4.—No. 449.

MACINTOSH, John, of Westminster, in the county of Middlesex, civil engineer.—" Improvements in " roads and ways, and the materials used for such purposes."

The object of the first part of my invention is to lessen the expense of constructing and maintaining roads and ways, also to decrease the mud, dust, noise, and slipperiness, and consists in the [*covering**] the concrete with adhesive bitumen, rendering it waterproof, over which is placed coarse cloths, saturated with vulcanized solution mixed with cotton, lead, pitch, wood, cork, or fibrous waste dust.

The second part of my invention is to lessen the expense of maintaining macadamised roads, also to decrease the mud, dust, and noise, and consists in using the mud taken from the roads, which is dried, sifted, and rendered impervious to moisture by mixing it with waterproof substances until it becomes a plastic heterogeneous mass, in which state it can be spread on to the roads. In some cases it is desirable smooth and waterproof the road with a coating of adhesive bitumen, alone or in combination with felt before applying the compound. It will be readily understood that mud dried and waterproofed, which is inexpensive, durable, preventing mud and dust, admirably adapted for covering roads in lieu of broken granite, which is rapidly reduced to mud and dust, causing the employment of men and water carts to reduce the nuisance, which will be obviated by my invention, to which I will give the name of the Macintosh road.

A.D. 1874, February 4.—No. 450.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Charles Frederick Gardner, director of the Blake Sole Sewing Machine Company, of* 121, *Bishopsgate Street Within, London, and Ebenezer Pocock, engineer, both of* 13, *Rue Gaillon, Paris, France.*)—" Improvements in lasting " boots and shoes, and in the apparatus employed for that purpose."

This invention consists in lasting the uppers of boots and shoes, solely by means of pressure applied externally on the upper in such a manner as to stretch it tightly without lasting tacks; also in adapting for the above purpose to upper and back portion of the last an upright rod, from which extend elastic arms which press on the different parts of the upper, and which are held with uniform pressure by elastic bands or other means.

A.D. 1874, February 4.—No. 451.

WEST, Henry Joseph, of Mason Street, Westminster Bridge Road, in the county of Surrey.—" Improvements in the production of ice, and apparatus therefor."

This invention relates to a process and apparatus for producing ice by mechanical power, working a pump to exhaust vapour of a volatile liquid from one vessel and condense it in another, the water to be frozen being in contact with the walls of the evaporating vessel, and cold water being made to circulate over those of the condensing vessel.

The two vessels are similar, consisting preferably of cells placed in a water trough with zig zag passages in those cells. When the water is frozen in the one set of cells the direction of flow to and from the pump is reversed, so that the evaporating cells now constitute the condenser, and vice versâ. The heat developed in condensation detaches the ice from the walls of the cells.

By this arrangement the usual brine circulation is dispensed with, and the alternation of the vessels for refrigerating and condensing, renders separate vessels for that purpose unnecessary.

A.D. 1874, February 4.—No. 452.

SMITH, Henry, of the county of the city of Dublin, Ireland.—" Improvements in or in connection with " window blind raising, lowering, and arresting apparatus, and in blind rollers, parts of such improvements " being applicable to boat, telegraph cable, and other weight lowering and arresting and holding apparatus."

One arrangement consists of a weighted lever and cam, between jaws and bed plate; the rope or cord passes between cam and bedplate; by raising weighted end of lever the cord is free to travel through; by letting it fall, its course is arrested by cam jambing it. Several weighted levers are sometimes used, the weights on same being adjustable as well as cam, according to the size of rope used.

A modified arrangement is described, consisting of a weighted lever, which raises a pawl out of ratchet teeth, and allows the rotation of blind roller; by releasing lever the pawl falls and stops the rotation of ratchet and blind roller; the ratchet and pawl are boxed up. Blind rollers caps are made so as only to grip the ends of roller at intervals, so that blinds may be secured close up to side of window fitting. Particularly applicable to venetian and ordinary linen blinds; also to boat lowering, to lowering and arresting telegraph cables, to raising and lowering maps, weights, and the like purposes.

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* The word " covering " is found in the copy of the Abridgment delivered by the Applicant, but does not appear in the original Abridgment.

A.D. 1874, February 4.—No. 453.

MAKIN, Samuel, and **SKERRATT**, William, of Salford, in the county of Lancaster, mechanics.—" Improvements applicable to throstle, worsted spinning and doubling frames."

The features of novelty in this invention consist in checking the waste made on such machines when an end breaks between the rollers and the flyer, and either winds itself round the rollers or becomes entangled with the threads of the neighbouring spindles, by the application of a small self closing clamp and actuating lever provided for each spindle, which, in case of a breakage of one of the ends in front of the rollers causes such end immediately to be snapped asunder at the rear of the rollers, and thus prevents such end continuing to draw off the cop on the creel and winding itself wastefully round either of the rollers.

A.D. 1874, February 4.—No. 454.

MURDOCH, Hunter Henry, of No. 7, Staple Inn, in the county of Middlesex, patent agent.—(*A communication from Barthelemy Picard, of Brussels, in the Kingdom of Belgium, tanner.*)—" Improvements in " the treatment of leather called 'sole leather,' for the purpose of hardening it and rendering it im-" pervious to water."

According to this invention the leather is first soaked in milk of lime or a solution of lime, and is then dried and greased, and the superfluous grease is rubbed off.

A.D. 1874, February 4.—No. 455.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Henri Antoine Prosper Lissagaray, of Pantin, in the Republic of France, chemist.*)—" Im-" provements in the preservation of the whites and yokes of eggs."

The essential feature of this invention consists in the employment of bisulphite of soda or other alkaline bisulphites in conjunction with an acid, for the purpose of rendering the yolks and whites of eggs imputrescible and capable of being preserved for food and for industrial purposes.

A.D. 1874, February 4.—No. 456.

WATTERSON, Charles, manager to James Marshall Beckett, of Vickers Street, Miles Platting, near the city of Manchester, manufacturing chemist.—" Improvements in the manufacture of the several oleates of " potash, soda, and ammonia, commonly known under the name of soluble oil, and applicable in the process " of finishing printed calicoes and silk goods, and other cotton and silk dyed goods, and velvets."

The invention consists in the treatment of olein or oleic acids, distilled or obtained by pressing, from all or any sources, especially from cocoa nut oil, palm oil, cotton seed oil, castor oil, and olive oil and nut oils, with caustic soda, potash, or ammonia, in the following manner, namely:—I place about a ton of castor oil, olein, or oleic acid into a pan capable of holding three tons, to which I add about 8 cwt. of caustic soda, containing 22 per cent. of alkali and 200 gallons of water. I boil the mixture slowly 12 hours, after which I add about a ton of cocoa nut oil olein, then 5 cwt. or thereabouts of caustic soda, and boil the mixture thus obtained for 10 hours; I then add 3 gallons of strong ammonia or caustic potash at 60 (Twaddle's hydrometer). I then make the total bulk with water up to 3 tons, adding potash or soda or ammonia, for purpose of suiting the mixture to the purpose for which it is required. This composition gives a brighter color and softer feel to the cloth than is obtainable from the ordinary oils, tallows, and soaps now in use.

A.D. 1874, February 4.—No. 457.

ANDRADE, Benjamin, of West Smithfield, in the city of London.—" An improvement in sausage meat " chopping machines."

This invention consists in applying a blade or scraper near the sides of the revolving block, on which the meat is minced or chopped up, in such a position that the meat shall be turned over and placed under the action of the knife, thus obviating the necessity of the attendant doing so with his hand.

The blade or scraper is fixed to the end of an arm attached to a suitable support, said arm being jointed that it may be put out of the way when not in use.

A.D. 1874, February 4.—No. 458.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Charles Franklin Wilson and Jesse Edward Folk, both of Brooklyn, in the state of New York, United States of America.*)—" Improvements in bolsters and step bearings for the " spindles of spinning frames; applicable also to other spindles and shafts."

This invention consists of a bearing or journal box having spiral slots or openings through its sides in combination with an oil cup. The invention also consists in a bolster applicable to the spindles of spinning frames constructed chiefly of sheet metal. The invention consists lastly of a step bearing which is formed of a hard metal socket having an opening in its bottom, and a soft metal casing cast around said socket and having holes cored in it for use in connection with the oil cup.

A.D. 1874, February 4.—No. 459.

NEWTON, ALFRED VINCENT, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Benjamin Talbot Babbit, of the city and state of New York, United States of America.*)—" Improvements in steam boilers with combined air heating attachment " and condenser."

This invention consists in combining a new arrangement of steam boiler with an air heating attachment which operates also as a condenser, whereby not only are the products of combustion as they escape from the furnace of the boiler utilized in heating currents of air, but such air is made capable of diversion by giving it an upward or downward draught, either to supply the furnace with heated air to promote combustion or to conduct the same to one or more compartments of a building.

A.D. 1874, February 4.—No. 460.

MARSHALL, JAMES, of Gainsborough, in the county of Lincoln, engineer.—" Improvements in apparatus " applicable to the furnaces of portable agricultural & other steam engines required for burning straw " & other light vegetable matters."

This invention relates to several improved methods of feeding straw and other similar light fuel to the furnaces of portable agricultural and other steam engines when required for burning straw and other light vegetable matters.

A.D. 1874, February 5.—No. 461.

WARREN, FREDERIC PELHAM, of East Court, Cosham, in the county of Hants, Captain in the Royal Navy.—" An improved pot for flowers and plants."

This improved pot is so made as to permit of the ready escape of all water or moisture in excess of the quantity which the earth and root or germ in the pot are capable of absorbing and retaining.

For this purpose the bottom of the pot is made of considerable thickness, and a passage or way or passages or ways is or are formed therein leading from the lowest part of the interior of the pot, and in connexion with such passage or way, or passages or ways, a groove, channel, or passage, or grooves, channels, or passages is or are provided, extending to the periphery of the base of the pot, so that any superfluous water or moisture from within the pot will descend by the first mentioned passage or way or passages or ways, and will escape by the groove, channel, or passage, or grooves, channels, or passages leading out as above described to the periphery of the base of the pot.

A.D. 1874, February 5.—No. 462.

CALLENDER, JOHN ARCHIBALD, of Edinburgh, in the county of MidLothian, North Britain, merchant. —" Improvements in railway signals."

The features of novelty which constitute this invention are the combination of ordinary with detonating signals, and the means whereby they are operated relatively with each other.

A.D. 1874, February 5.—No. 463. 6

HEDGES, KILLINGWORTH WILLIAM, of Wootton-Lodge, Streatham Hill, in the county of Surrey, civil engineer.—" Improvements in combined steam boilers and steam engines."

This invention relates, firstly, to the furnaces of that class of combined engines and boilers in which the furnace is contained in the centre of the firebox.

It provides against the tendency to split that the present furnaces have, also for a better distribution of the heat from furnace. Various novel additions are shown, to enable gas to be burnt in the same furnaces.

The second part of the invention relates to improvements in the construction of that class of combined engines and boilers in which the cylinder is contained in the boiler so as to simplify the construction of the engine, and render the joint between the cylinder and boiler more durable.

A.D. 1874, February 5.—No. 464.

SHERMAN, John Edwin, of Bucksport, in the state of Maine, United States of America, but at present residing at Norbiton Hall, in the county of Surrey.—" Improvements in stoves or fireplaces, and in apparatus " connected therewith."

My invention relates to an improved form and arrangement of stove or fire place for the purpose of economizing the consumption of fuel and preventing the smoking of the chimney; and consists essentially in the employment of an enclosed air space or chamber, situate at the back of the stove or fire place and at the lower part of the flue, in combination with a peculiar arrangement of the front and back of the stove, whereby the heat is directed into the apartment, and its escape up the chimney and down draughts are effectually prevented; also in the employment of a revolving or sliding curtain blower.

A.D. 1874, February 5.—No. 465.

WEBSTER, James, of Birmingham, in the county of Warwick, engineer.—" Improvements in apparatus to be employed in the manufacture of steel,"

This invention refers to certain improvements in apparatus for regulating the formation, mixing, and flow of atmospheric air and common coal gas, such mixture being employed in the carburizing of iron to produce steel.

A.D. 1874, February 5.—No. 466.

TAVERNIER, Louis Ferdinand, junior, of Leeds in the county of York.—" Improvements in the production of felts and felted fabrics."

This is effected firstly by felting or amalgamating carded wool or other filamentous body or substance as a bat upon a woven fabric made of carded woollen yarns, say upon a flannel with or without cotton warp.

Secondly. By producing a felting operation by mechanical appliances or apparatus.

Thirdly. Manufacturing ordinary felt for carpets and the like, so that the printing or colours are caused to show upon both surfaces of the fabric.

A.D. 1874, February 5.—No. 467.

CAFFALL, Robert May, of 75, Fleet Street, in the city of London, and **THOMAS, Alfred**, of Alton, in the county of Hants, gas engineer.—" Improved means of and appliances for effecting the automatic " sealing of hydraulic gas mains, and for removing the pressure of gas on retorts at pleasure."

This consists mainly in an arrangement and employment of a loose extension portion of pipe below that known as the dip pipe in the hydraulic main, which extension piece is capable of being raised and lowered from the outside in any suitable manner, preferably by a rod connecting the extension piece with a lever.

A.D. 1874, February 5.—No. 468.

HALL, Joseph, of Leeds, in the county of York.—" Improvements in machinery for squeezing or extracting the liquid matter from 'spent tan,' 'spent hops,' 'old used waste,' and other materials."

This consists of a pair of rollers, one fluted, and of a spirally fluted feed roller, its position being adjusted by springs. Rollers are arranged in adjustable bearings, so that hard substances can pass between. Sometimes the rollers are heated by steam.

A.D. 1874, February 5.—No. 469.

COATS, Peter, junior, of Paisley, in the county of Renfrew, North Britain, thread manufacturer.—" Improvements in machinery for rewinding yarn or thread."

The invention consists in mounting the bobbins, off which the yarn or thread is to be rewound, on wooden spindles arranged to run in bearings, by preference of glazed stoneware or earthenware; and by adjusting the inclination of the spindles, the tension or drag on the yarn or thread is regulated with the greatest nicety.

A.D. 1874, February 5.—No. 470.

PAGE, Thomas, of the Reform Club, Pall Mall, Westminster, in the county of Middlesex, gentleman.— " Improvements in steam ships."

The attainment of a high rate of speed by the combination referred to in the Provisional Specification, together with the absence of prejudicial rolling consequent on the peculiar form of the ship's hull.

A.D. 1874, February 5.—No. 471.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Johan Ludwig Leeb, a person resident at Paris, 182, Boulevard Haussmann.*)—" A new or improved construction of table top."

This table consists of two plates connected or hinged together, the upper plate being a plate glass, part of which is made opaque whilst the rest left transparent for the purpose of placing advertisements or designs underneath, the other plate of wood or metal being fastened to a foot or feet of any desired form.

A.D. 1874, February 5.—No. 472.

OLDERSHAW, Henry Alfred, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—" An improved machine for turning down and fitting the gussets and other parts of boots and shoes."

The feature of novelty of this invention consists in making a machine by means of which gussets and other parts of boots and shoes may be turned down and fitted more expeditiously and better than by hand. This is obtained by means of a heated block the top of which is movable; around this block is placed a spring plate which is depressed by a treadle, and to which is hinged a second plate. The gussets are placed between the spring plate and the hinged plate; the spring plate is then depressed and the movable part of the block aforesaid brought forward.

A.D. 1874, February 5.—No. 473.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Thomas Poole, of Canterbury, New Brunswick, Canada, school teacher.*)—" Improvements in combined life preserving dresses and air-buoys."

The objects of this invention are to protect the wearer of the dress from the effects of water and to prevent submersion, and it consists, first, in a life preserving dress of undivided parts of material impervious to water and of about the form of the human frame, ingress to which is obtained by the wearer through an opening in a hood, which opening contracts when entered and is surrounded by a cord produced by a sudden thickening of the india-rubber around the opening and closed between inserted hoops, one of which has a tympan provided with an elastic opening to fit the face and thereby exclude the entrance of water.

Secondly. In the combination with the dress of undivided parts of air-buoys in front and rear provided with inflating tubes and straps passing under the feet, and with stirrups, shoulder, waist, and body straps for securing the buoys in position.

A.D. 1874, February 5.—No. 474.

HASELTINE, George, of the " International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from William Gould Beckwith, of Newark, New Jersey, United States of America.*)—" Improvements in sewing machines."

This invention relates to sewing machines in which a needle and hook co-operate to form the stitch, and in which the material sewn is fed along by means of the needle, and it consists in a novel construction, combination, and arrangement of parts which have for their object to produce an improved, simple, effective, and cheap sewing machine.

A.D. 1874, February 5.—No. 475.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Samuel Walker and Company, of Lille, in the Republic of France.*)—" Improvements in machinery or apparatus for heating or heckling flax and other fibrous materials."

This invention relates to improvements in the machinery for hackling flax and other fibrous materials, and consists in driving the roughing sheet of the hackles at a speed varying according to the position of the trough carrying the flax holders. The hackling sheet being divided into two part (one for finishing and one for roughing), instead of one continuous sheet, as usually done, each of which is mounted on two separate shafts, so that the two half sheets may be driven independently. Also in the application of a self adjusting catch bar for pushing forward the flax holders in the trough so as to prevent breakage.

A.D. 1874, February 5.—No. 476.

GROVES, Thomas Bennett, of Weymouth, in the county of Dorset, pharmacist.—"Improvements in "cigarettes and cigars."

This Provisional Specification describes keeping on the ash by wires inserted into the cigarette or cigar, or otherwise applied. Other substances may be used instead of wires.

A.D. 1874, February 5.—No. 477.

HOOKER, John, of 1, Essex Street, Saint Peter's Street, Islington, in the county of Middlesex.—"Improvements in type setting and distributing machines."

This Specification describes working the pushers for discharging the type one by one from the reservoirs of type setting machines by electro magnets, and means of collecting the type into line, with speed and certainty; also arrangements for supporting the reservoirs, and for conveying type from the reservoirs to the setting up point.

The Specification also describes distributing machines, in which electro magnets are used for controlling the collection of the type into their proper receivers.

A.D. 1874, February 5.—No. 478.

HYATT, Thaddeus, of Gloucester Gardens, Hyde Park, in the county of Middlesex.—"Improvements in "the treatment of asbestos, and in its application to various useful purposes in the arts and manufactures."

This invention consists of various modes of treating asbestos, so as to remove from the filamentous particles the siliceous and other impurities mixed therewith, and in the employment of the prepared and finely divided asbestos in conjunction with silicates and other materials, for the production of fireproof materials, bearings, and other applications.

The invention further consists in the production and use of asbestos in the form of rope or in a kneaded or fitted form, for packings, bearings, or other purposes.

A.D. 1874, February 5.—No. 479.

BACKHOUSE, James, of Armley, near Leeds, in the county of York.—"Improvements in steam cultivating implements."

All the tilling tools can be lifted and secured when required; they are coupled to drag bar or centre beam, the dragbar having a backward sliding motion. The draft and tail rope are attached to drag bar by bell crank lever.

The draft pole couplings are fitted to fixed radial draw bar.

The naves of each travelling wheel have ratchets into which pawls on axles take, for raising the tilling tools when the implement is being turned. Provision is made for the tines to rise when they come in contact with obstacles in ground.

The rope porters are self steering.

A.D. 1874, February 5.—No. 480.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Louis Chiozza, of Paris, France.*)—"Improvements in treating and separating the constituents of maize for the production of flour."

This invention relates to an improved process for separating the oily from the farinaceous parts of maize, and to the manufacture of perfectly white flour from various kinds of white maize, which may be kept for a length of time without liability to become rancid.

A.D. 1874, February 6.—No. 481.

ELDER, Hugh, of Easter Bearford, in the county of Haddington, North Britain.—"Improvements in "railway brakes."

The feature of novelty which constitutes this invention is the arrangement and construction of apparatus whereby the brake blocks are applied to the wheels of all or a number of the carriages constituting the train.

A.D. 1874, February 6.—No. 482.

BAXTER, John Cordy, of Chatham, in the county of Kent, Lieutenant in the Royal Engineers.—"Improvements in boilers and engines or apparatus for obtaining motive power by means of elastic fluids."

The boilers and engines are so arranged that air is employed to promote the generation of steam, superheat it and blend with it, or act in conjunction with it to obtain motive power, also to prevent incrustations and carry off noxious vapours.

In one arrangement the air is introduced into the furnace and the gaseous products of combustion are purified and mixed with steam.

In another arrangement the steam and gas work in separate cylinders, but apply power to the same shaft. The gaseous products may be carried into and through the water in the boiler to promote the generation of steam. The waste working fluid is carried from the cylinder into the feed water heater, into which water is showered, and the carbonic acid prevents the escape of noxious vapours, or the vapours may be treated in a separate vessel with salts for taking up the gases.

A.D. 1874, February 6.—No. 483.

THWAITES, William Cozens, of Grasmere Villa, Clyde Road, Redland, Bristol.—"A new or improved safety apparatus or receptacle for securing watches and valuables."

Stamping-up or otherwise forming in thin metal a case or receptacle having a spring hinged cover or flap to close the mouth or opening, and snap or spring-catch fastener or fasteners to keep it closed, the interior being lined with wash-leather, velvet, or other suitable material; and the case or receptacle being secured within the pocket of the waistcoat or other vestment, by stitching through pierced holes, or by means of eyes or other projections passing through and secured by a pin or pins between or behind the lining.

A.D. 1874, February 6.—No. 484.

FRANKENSTEIN, Philip, of Albert Buildings, Miller Street, Manchester, in the county of Lancaster, manufacturer of water-proof garments.—"Improvements in waterproof over-coats."

The inventor forms "india-rubber" over coats with capes, which shield perforations or apertures which ventilate the upper part of the coat.

A.D. 1874, February 6.—No. 485.

HARROP, James John, of Manchester, in the county of Lancaster, lead-merchant.—"Improvements in the manufacture of tin-lined lead piping, and of tin and lead piping, and of soil and water pipes, and in the apparatus employed in such manufacture, and in the covering of telegraph cables with lead."

According to this invention, when making tin-lined lead piping, the ingot is cast in the press. The core bar is carried by a cross head which is connected with the ram head, so that the core bar moves at the same speed as the die. When a rising container is used the ingot is cast on the remainder of the previous ingot left in the container, the pipe issuing downwards through a sliding tube. When covering a cable with lead, the cable passes upwards through the last-named tube. A second part consists in supplying water to the inner rams by means of pipes sliding in glands on the supply pipes. Another part consists in heating the container by means of mixed gas and air. The winding drums are driven by power, and in some cases by means of a differential motion, and the coiling of the tube is regulated by a transversing guide.

A.D. 1874, February 6.—No. 486.

FORD, Samuel, of No. 12, Lansdown Place, South Lambeth, in the county of Surrey, engineer.—"Improvements in prime movers actuated by the explosive force of mixtures of gases."

The inventor adapts rotatory engines to be actuated by the explosion of gases, and admits water to the inside of piston drum and into a casing surrounding the cylinder. The drum is formed to act as a valve. A valve kept open by means of a spring, closes when explosion takes place, and closes gas supply pipe. A valve admits air to cylinder when a vacuum is formed.

A.D. 1874, February 6.—No. 487.

LEDBROOK, John, and MILLS, James Henry, both of Snow Hill Station, Great Western Railway, Birmingham, in the county of Warwick, inspectors.—"An apparatus for the self adjusting of all kinds of railway signal and other wires."

The invention, as applied to an ordinary signal wire or chain, consists in attaching the wire or chain to both ends of a metal slide or bar perforated with closely drilled holes, or dentated or notched, into which a grapnel, which is attached to a lever and furnished with teeth or with one or more studs, drops down an inclined plane, at once securing the slide or bar by pulling the lever over, thus shewing an "all right" signal. After the passing of a train, or when the "danger" signal is required, the lever is reversed, and the grapnel thus forced along a groove until it detaches itself from the slide or bar by running on rollers up an inclined plane. The wire then adjusts itself by a back weight or spring.

A.D. 1874, February 6.—No. 488.

KAYSER, Charles William, of Sheffield, in the county of York, manufacturer.—(*A communication from Theodor Schultz, of Vienna, Austria, engineer.*)—"Improvements in or connected with steam, hydraulic, "blowing, pumping, or water engines."

In carrying this invention into practice the cylinder is constructed and arranged or made to form a bedplate, and has all other parts attached to it, the guides being united with one of the lids, and the bearing for carrying the fly wheel or driving shaft with the other.

Between the guides the piston moves to-and-fro attached to the crosshead, the latter being united at each end by connecting rods with the cranks fixed on the driving shaft.

For bolting the machine against a wall or foundation, brackets are fixed on the cylinder alone, or on the cylinder and to one of the lids, according as the construction of the machine, whether horizontal, vertical, or of any other description, requires.

A.D. 1874, February 6.—No. 489.

MORE, John Walter, of Market Street, Finsbury, and **NORMAN, John**, of Hoxton Square, both in the county of Middlesex.—"Improvements in harness saddles or 'pads.'"

For this purpose the "tree" is formed with a trough in which slides the "back band," and the "flaps" are connected to the "tree" by means of staples which pass through holes in the "tree" and "flaps" and through metal plates enclosed between the "flaps" and "flap linings" to bind those parts firmly together. The staples pass over the top of the trough and serve to retain the "back band" in position, whilst the "terrets" are screwed into the holes in the centre of the staples. In some cases simple "terret" plates are used in lieu of the staples.

A.D. 1874, February 6.—No. 490.

BARNETT, John, of Kennington Road, in the county of Surrey, engineer.—"Improvements in machinery "and apparatus for obtaining and applying motive power."

This invention relates to improvements in connection with machinery and apparatus in which motive power is obtained by means of powerful coiled springs, and which motive power is capable of being applied to the purposes of propulsion, whether on land or water, and to other purposes for which a rotary action is required. The improvements consist in combinations and arrangements of apparatus whereby the springs are wound up and the motive power thus obtained communicated to the driving wheels of the machinery by means of wheels, pinions, and crank actions. The invention also embraces arrangements for winding the springs automatically by the action of the driving wheels.

A.D. 1874, February 7.—No. 491.

CRAMP, Charles Courtney, of 87, Litchfield Road, Grove Road, Bow, in the county of Middlesex, engineer.—"Improvements in the construction of tramways, and apparatuses connected therewith."

My inventions are designed to further the safety of ordinary vehicles on roads traversed by tramways, and to render more permanent and economical than the present system. The chief feature of my rails is that the stones and rails are keyed together, thus forming an endless track which prevents vehicles skidding, and allow of them to leave the track quickly and easily. The chief feature of the plough is that it requires no attention from driver or conductor, it being attached to the axle boxes, it is stationary, and can be fixed to any required distance from the rail, the plough being jointed, and kept up to its work by a spring, this if any serious obstacle is meet, the plough gives way, and when the obstacle is passed, returns to its work.

A.D. 1874, February 7.—No. 492.

VON ESSEN, Wilhelm Sylvester, engineer, of Hamburg.—" Improvements in apparatus for cleaning " tubes of steam boilers."

This consists of a row of horizontal tubes, closed at one end and communicating through pipes at the other end with the steam boiler. The horizontal tubes are placed in front of the corresponding boiler tubes, and the steam inlet is opened, allowing the steam to rush into the boiler tubes through borings in the horizontal tubes, the power of the steam removing all impurities from the tubes.

A.D. 1874, February 7.—No. 493.

HOCK, Julius, of Vienna, Austria, but at present of No. 26, Ely Place, Holborn, in the county of Middlesex. —" Improvements in motor engines worked by the combustion of petroleum or other liquid hydrocarbons."

This invention relates to the construction and operation of engines for producing motive power by the combustion of petroleum, or other liquid hydrocarbons.

A piston connected to a crank is moved over part of its stroke by the momentum of a fly wheel, and draws into the cylinder a charge of air and liquid hydrocarbon broken into spray by the entering current of air. A crank, cam, or eccentric works a pump bellows or elastic ball, which sends air through volatile petroleum or other hydrocarbon. Part of the air thus charged with combustible matter supports a constant flame near an opening into the cylinder, another portion is at the proper time made to jet across this flame, and so carry a flame into the cylinder and ignite the charge therein. The pressure resulting from combustion closes inlet valves and propels the piston. During the return stroke of the piston a slide or valve is opened for the escape of the products of combustion.

A.D. 1874, February 7.—No. 494.

WEBB, Francis William, of Crewe, in the county of Chester, engineer.—" Improvements in mechanism " or arrangements for actuating railway points and signals."

1. It relates to and consists in an improved combination, arrangement, and construction of mechanism for holding the point and signal levers, and locking the same in their correct positions after having been moved.
2. It relates to and consists in the form or section of the horizontal locking bars, and mode of securing the locking projections therein.
3. It relates to and consists in the form or section and mode of guiding the rods that transmit motion from the point levers to the points.
4. It relates to and consists in the form and arrangement of a lever handle upon point and signal levers (a substitute for the ordinary trigger) so that the catch may be actuated, and the lever pulled or pushed over by the same handle.
5. It relates to and consists in a system or mode of locking points, at the points, and indicating that they are in their correct position, before the danger signal can be lowered; and preventing the signal from being acted upon if the points are not correct, and the signals and points from being moved while a train is passing over the points.

A.D. 1874, February 7.—No. 495.

BENSON, Martin, of No. 9 Southampton Buildings, London.—(*A communication from William G. Rehbein, Henry Roberts and Perry Espey Brocchus, all of the city and county of Baltimore, in the state of Maryland, United States of North America.*)—" Improvements for welding copper."

My improvement consists first, in taking the biborate of soda (borax) and heat it untill all its water of crystallization is evaporated, then pulverize the dry residuum, next prepare the two pieces of copper to be welded so that the surfaces form a lap joint or any other desired form of union. Then apply the prepared borax on and between the surfaces; and hammer them together when hot. The joint thus prepared is brought to a white heat; powdered over quickly with chloride of magnesium, chloride of sodium (salt), or with any of the chlorides or equivalent compounds which may be deemed most suitable for the purpose of excluding the oxygen; and finally welded. The weld or joint thus effected will be found to be strong, perfect, and durable. Another method by which this weld can be effected is by directing a stream of chlorine gas upon the heated copper during the process of welding,

A.D. 1874, February 7.—No. 496.

QUIN, Richard, of Poland Street, Oxford Street, in the county of Middlesex, jewellery case maker.—" Improvements in cases for cigars and similarly or approximately formed articles."

These cases are provided with spring holder arrangements which so act that one cigar or article can be withdrawn at a time, and others in a case remain firmly held therein.

A.D. 1874, February 7.—No. 497.

ROSE, Lauchlan, of 41, Mitchell Street, Leith, in the county of Edinburgh, lime juice merchant.—" An improved stopper for bottles for containing gas or gases combined with liquids, such as aerated beverages, whereby an improved mode of filling, stoppering, and opening such bottles can be effected."

This invention mainly consists in an improved stopper or cap, which is either constructed of the ordinary shape or as a cap, and in the case of stoppers of ordinary shape is formed with an external screw thread or catch, but when constructed as a cap the screw or catch would be formed internally, such screw thread or catch taking into a corresponding thread or catch in or on the neck of the bottle, and by this means the stopper or cap is firmly held to the bottle. The stopper or cap is formed with an orifice or sufficient inlet to serve for filling the bottle with the liquid or gas as desired.

A.D. 1874, February 7.—No. 498.

CAMPION, George, of Ramsey, in the county of Huntingdon, ironmonger and manufacturer.—" Improvements in harrows and such like implements employed in cultivating land."

The frame of the instrument is obtained by the bending of the separate bars in zig zag directions, but this separately considered forms no part of my invention. These bars are bent into the desired forms in a cold state, and parts of them are produced in planes parallel to the direction of the length of the harrow, to facilitate the connection of the several bars together. Between these parts the upper portions of the tines are applied, so that a screw bolt through two of such bars and the upper portion of a tine unites the three parts together.

The upper parts of the tines are formed with a double flange to bear on the upper surfaces of two adjacent bars, or such flanges may be applied to bear on the under side of such bars or both on the upper and under surfaces, or the upper ends of the tines are formed to turn over one or both adjacent bars on the same side, or by separate turned over parts on each side of them, and these flanges on one side may pass to the full depth of such bar or only so far as to form an abutment to and prevent the turning of the head of the connecting bolt or the nut thereof.

The coupling chains are secured to the respective bars by hooks and eyes and nuts, the stems of the hooks and of the eyes being passed through the outside bars and being there held by nuts.

The ends of the respective bars at the front and back of each frame are held in correct relative position by similar bars bent in short lengths, the bent parts of which are turned to rest against the other bars and be held by the same screws and nuts that hold the end tines to their bars, or these end bars may be simply continuous to the full width of each frame, with screws at their intermediate parts from the ends of zig zag bars.

The stems of draught hooks are held by having a slotted opening formed in each of them, to embrace the upper end of a tine, aided by clips to embrace an end bar, each of such clips having screw stems to pass through a hole in the respective draught hooks and receive suitable nuts.

For drag harrows additional transverse bars are applied, having holes corresponding with the form of the upper parts of the stems of the tines applied by the tines passing through them, and secured by the bolts and nuts used in securing the parts of the frame and the tines together.

Harrows with lifting handles have the stems of the handles secured in a similar manner to the draught hooks.

A.D. 1874, February 7.—No. 499.

UNDERHAY, Frederick George, of Crawford Passage, Clerkenwell, in the county of Middlesex.— " Improvements in bib cocks or cocks for drawing off water."

This Provisional Specification describes a valve closing against the flow; it is balanced by a cupped piston and closed against its face by a spring. The closing is controlled by a disc on the valve stem beyond the piston, fitting very nearly a chamber in which it works.

A.D. 1874, February 7.—No. 500.

EVERETT, George Alonzo, of the city, county, and state of New York, in the United States of America, but at present of 23, Southampton Buildings, in the county of Middlesex.—(*A communication from Franklin Wisner Brooks, of the city, county, and state of New York, in the United States of America.*)—"Improvements in liquid meters."

The invention consists in the employment of a chamber through which the liquid to be measured is forced, and in which is mounted a screw formed with a solid central portion, around which are arranged a number of blades, said screw having mounted on its spindle a crown gearing with a suitable counting apparatus.

A.D. 1874, February 7.—No. 501.

BARON, John, yarn agent, and **RICHMOND, Thomas**, and **RICHMOND, William**, manufacturers, all of Burnley, in the county of Lancaster.—"Certain improvements in and applicable to looms for weaving."

Our invention consists of an improved apparatus for damping the warp in the loom to give elasticity to the yarn and to prevent breakages; also in an improved mode of varying the tension of the spring attached to the shuttle peg so as to adapt the spring to cops with different sized holes.

A.D. 1874, February 7.—No. 502.

CURTIS, William Joseph, of Holloway, in the county of Middlesex.—"Improvements in railway points "or switches."

The first part of these improvements relates to improved means of securing the points of what are commonly called facing points or switches, so that when the engine or train runs against or upon them, the point is locked or immoveable; at the same time when the engine and train run off the point or switches, the switch is self acting as at present. This object is accomplished by connecting each separate switch bar with a separate link communicating with a crank working the switches, so that the locking is effected by the centres of the connecting rod being at or near the centre of motion of the crank. The crank or connection of the other switch rail or bar being at the same time at an angle with the other crank in somewhat the same way as the cranks of an engine, whereby one is at half stroke when the other is at the dead centre.

According to another part of the improvements the two bars or switches of the cross line are connected by forming the ends like wedges which work upon the upper surface of the main line, the wedges rising from the point to a distance of 4 or 5 feet a space of about 2 inches sufficient to allow the flanges of the wheels to cross the main line of rails; by this means an unbroken line of rails may be preserved throughout the main line of railway as far as the switches are concerned.

A.D. 1874, February 7.—No. 503.

DUNN, William Wallace, of San Francisco, California, United States of America, now of No. 8, Southampton Buildings, London, engineer.—"Improvements in machinery for drilling or boring rocks and other "hard substances, parts of which improvements are applicable to other purposes."

My invention relates to improvements in machines of that class in which the drill or perforating implement is carried and operated by a piston driven to and fro by the pressure of steam or other elastic fluid. The said invention consists first in novel means for effecting the rotation of the piston and drill or perforating implement during the working of the machine. Secondly, to mechanism for operating the valve which controls the admission of the steam or other fluid to the cylinders of the drilling machine. Thirdly, in automatic mechanism for producing the feed or advance of the drill into the rock or other substance being perforated. Fourthly, to a peculiarly constructed friction device to be applied to the feed motion of these machines and for other purposes as herein-after explained. Fifthly, to a novel contrivance for indicating the proper regulation of the feed or advance of the drill when the same is effected by hand. Sixthly, in the employment in combination with the above described improvements, of means for cushioning the piston and ensuring its quick recoil at the end of each stroke. Seventhly, to the peculiar construction of the framing and of the joints for supporting the machine on the same. Eighthly, to the combination of these various improvements or any of them with the other parts of the machine.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

bridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 1 to August 7, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, February 9.—No. 507.

LACKBURN, Bewicke, and **BLACKBURN**, Alexander Bewicke, of No. 1 York Buildings, Adelphi, the county of Middlesex.—" Improvements in the means and apparatus for working steam engines expansively."

This invention relates to means and apparatus for working steam engines expansively by admitting to the orking cylinder a definite charge of steam from a chamber charged from the boiler. This may be effected a single slide or by separate slides or valves worked so as alternately to put the charging chambers in mmunication with the boiler and with the respective ends of the cylinders.

The degree of expansion may be varied by varying the capacity of the charging chambers by means of justable pistons worked by hand or by a governor.

The steam jacket of the cylinder or portions thereof may be utilised as charging chambers.

A.D. 1874, February 10.—No. 517.

RR, John Bryson, of Glasgow, in the county of Lanark, North Britain, manufacturing chemist.—Improvements in obtaining a white pigment, and in the process employed therefor."

The features of novelty which constitute this invention are—

First. The production of a compound or combination of barium sulphate and zinc sulphide.

Second. The chilling of the said compound or combination so as to increase its density and impart body ereto.

A.D. 1874, February 11.—No. 531.

HNSTON, William, of Lima, Peru, but at present residing at 47, Lincoln's Inn Fields, in the county Middlesex, engineer.—" Improvements in machinery or apparatus for compressing air or gases."

Apparatus for compressing air by the employment of a series of cylindrical chambers of diminishing pacities, each being partially filled with water, mercury, or other fluid, which by the oscillation of the said lindrical chambers on a fixed axis acts as a piston or pistons, and by means of suitable valves and conctions drives the air in an increasing compressed state through the whole series of chambers into the last receiving vessel, from which it passes through the axis of the apparatus to be used as required.

A.D. 1874, February 13.—No. 550.

ERKS, Thomas, the younger, of the firm of Thomas Perks and Sons, of Birmingham, in the county of arwick, jewellers.—" Improvements in brooches, shawl pins, nursery pins, and other like fastenings."

This invention consists in securing the pin or arm of the brooch or other article, and protecting the point f the pin by the following combination of parts. On the back of the brooch or article where the usual op is situated, a barrel or tubular case is fixed into a slot, in the side of which the pin is passed by a teral motion. A second barrel or tube works in the fixed barrel or case. By sliding inwards the said cond barrel it closes the slot in the fixed barrel and fastens the brooch, and by surrounding the point of e pin protects the said point. By drawing back the sliding barrel, the point of the pin and the slot in e fixed barrel are uncovered, and the said pin may be removed for unfastening the brooch or other article. he slot may be in the upper side of the fixed barrel, and the sliding barrel may be secured by a bayonet nt fastening.

A.D. 1874, February 13.—No. 552.

GOATER, John, of Clarence Cottage, South Street, Ponders End, in the county of Middlesex, mechanic. —"Improvements in arranging and combining the materials used in the manufacture and construction of " fire and burglar proof safes, strong boxes and other receptacles, and the parts connected therewith."

Forming tenons, dovetails, or projections on the sheets or plates of metal employed to make safes, strong boxes, or other receptacles; and causing the said tenons or projections to enter "bell mouthed" or dovetail slots, mortices, or openings formed in L or angle shaped pieces or parts of metal placed on the interior of the safes, strong boxes, or other receptacles, into which slots, mortices, or openings, the said tenons or projections are hammered or otherwise caused to fill the said slots, mortices, or openings.

Employing a grooved bar or bars of metal, provided with a bearing or pivot at each end working in the framework of the safe, strong box, or other receptacle, which have a rotary or partially rotary movement on opening or closing the door on the said pivots or bearings, the edge or edges of the door entering the said groove; and when the door is closed the edge or edges of the same is or are embedded in the said grooved bar, and the outside edge or edges overlaps or overlap the door, thus firmly closing the opening or openings between the edge or edges of the door and the frame, and opposing a solid resistance to the wedge, lever, or other implement.

Placing pieces of granite, flint, slag, copper dross, steel, chilled cast iron, or hard material of a convenient size and form, in a casing, and running into and amongst them molten metal; or applying concrete, cement, iron cement, or other suitable substance or substances, to cause them to keep together in a mass, and placing the said casings as a lining for the interior of the safe, strong box, or other receptacle, so that it shall not be in direct contact all over with the shell of the safe or receptacle, but shall have a certain yielding action on the application of intermittent pressure so as to recede from and spring back to its normal position.

Forming the cap of the lock of a combination of hard and soft metals, or hard metal, or arranging lock so as to form a receptacle for the same.

Placing a part on the stump of the lock tumblers, which enters a notch or notches in the slot of the bolt and prevents picking.

Employing low heat conducting material, such as portland cement, roman cement, Keene's cement, for fire proofing; and placing the alum, soda, or other steam generating substance or substances in boxes or cases of wood, papier maché, card board, or other suitable material, or in boxes or cases of thin sheet iron, tin, or other suitable material, perforated or otherwise, so arranged as to allow the ready escape of the steam or vapour when heat obtains access, and placing these said boxes or cases in their places, surrounded with and covered by the cement or other materials used for resisting heat.

A.D. 1874, February 18.—No. 601.

McBEATH, Charles, of South Cobbinshaw, in the county of Edinburgh, North Britain, carpenter.— " Improvements in retorts and apparatus connected therewith, for the purpose of distillation and calcination " of minerals, parts of which are applicable to other purposes."

This invention consists first of improvements upon the retort or still and condensing apparatus, described in the final Specification of the invention for which Royal Letters Patent were granted to the petitioner, dated 29th October, 1866, No. 2788, for the distillation of shale and coal, for the production of oils, paraffin, tars, and ammonia, and illuminating gas therefrom, and also for calcining ironstone and limestone for the usual purposes of making iron and ardent lime, and also for the new purpose of obtaining crude oil and tar, and carbonic acid and sulphuric acid from the former, and chlorine and carburetted hydrogen from the latter; and secondly, of a new or improved construction of fluid exhausting and forcing apparatus or pump for drawing off the gases as they are evolved in the retorts, and in forcing them through or into condensers of either the improved construction referred to under the first part of this invention, or it might be of other retorts or stills and condensers for treating and obtaining the substances stated.

The nature of the improvements under the first part consists in making the conical retort square or rectangular at the lower open combustion mouth a short distance above the furnace bars, which are round and hollow with angled projections on them, for being turned at intervals by wheels and motive power, or a hand winch for the distillation of shale, but for ironstone and lime these bars are not required. An annular or narrow space is left between the outside of the retort, and the inside of its close heating chamber or outer brickwork, supporting the retort above the hearth, and having a flue and controlling damper at top leading to a separate chimney for each retort, or to a chimney for or common to a set of retorts. Another improvement consists in placing the conical feeding vessel, concentric at top, with a neck charging pipe dipping down into the mineral being treated, below the branch or pipe at top for drawing off the gases as evolved, by the new or improved exhausting or forcing machine, which consists of a large hollow double concave dome-ended vessel, with an elastic or flexible disc or diaphragm, jointed tightly between flanges, formed in the centre between the said ends, so as to form two suction and discharge chambers out of the said vessel, by the reciprocating of the said diaphragm to and fro within it as a piston by the action of a rod working out through a stuffing box at one end, having its inner end attached by broad circular disc flanges to and on each side of the middle of the diaphragm, so that it and the rod are actuated, by a connecting rod and crank from any adjacent motive power engine or geared shaft. The gases are drawn off from the top of the retort through entering ducts and valves into each chamber on the in-stroke, and discharged through outlet valves and ducts on the out-stroke into the condensing apparatus, which may be of the construction described in the Specification of the inventor's said former patented invention, or of other forms and arrangements of condensers, such as a number of close condensing vessels, with the inlet forcing pipes led down some inches into the condensed liquids in them, and the outlet branches or ends led away from the top of each vessel, so as to conduct the gases not condensed down into and through the condensed liquids of the next vessel in succession, the last vessel or its duct having an outlet valve to conduct the permanent gases to a chamber, for subsequent use, as when inflammable for lighting and heating purposes, or for being led by a pipe back into the hearth of the retort to assist in the distillation or calcination of fresh mineral.

A.D. 1874, February 18.—No. 617.

EGERTON, Philip, of Cleveland House, Cheltenham, in the county of Gloucester.—"Improvements in "mounting spindles to be used for carrying revolving brushes, drills, and such like, to enable them to be "applied by hand in any desired direction."

The object of this invention is to transfer a very rapid revolving motion from a lathe or other wheel revolving in stationary bearings to a spindle which can be held in one hand, and (being fitted with different kinds of brushes or with a drill) may be applied in a horizontal or vertical direction to any part of an object either fixed or held in the other hand.

A.D. 1874, March 5.—No. 816.

BROWNE, Rowland Jay, of Kidwelly, in the county of Carmarthen, gentleman.—"An improved mode "of and apparatus for obtaining motive power."

The object of this invention is to utilize the vertical motion of a floating vessel (whether moored or not) in a sea-way for the compression of air which may be employed in any desired manner as a motive power.

A.D. 1874, May 21.—No. 1799.

ALEXANDER, Edwin Powley, of 14, Southampton Buildings, London, consulting engineer and patent agent.—(*A communication from Albert Schmid, of Zurich, Switzerland, engineer.*)—"Improvements in liquid "meters; applicable also as a motive power engine."

This improved liquid meter consists of a pair of oscillating cylinders mounted on concave supporting surfaces, and having corresponding convex port faces which fit and rock upon the concave fixed surface. Two inlet ports are made in the convex port faces, and a single outlet port in the concave fixed surface. The piston rods of the cylinders are connected to crank pins at right angles on a crank shaft, which shaft gives motion to the counting mechanism. The whole is enclosed in a liquid tight box or casing, into which the liquid (under pressure) to be measured is admitted by a supply pipe. The liquid in the casing gains access to each end alternately of each cylinder through one or the other of the inlet ports, which become exposed or fully open to the interior of the casing each time the corresponding piston arrives at the middle of its cylinder, or at half stroke. The measured liquid is forced out of the cylinders through the exit ports in the concave supporting surface and passes thence to the exit pipe.

A.D. 1874, August 4.—No. 2699.

MOURET, Louis Jerome Napoleon, civil engineer, of 13, Rue Gaillon, Paris, France.—"Improve- "ments in the arrangement and construction of model globes driven by clockwork, for the purpose of "demonstrating at all times all the astronomical phases of the earth with reference to the sun."

This invention describes the construction and general arrangement of mechanism for demonstrating and passing a model globe through the phases of our planet, and also at the same speed conjointly with a time piece, the globe being actuated by a prime mover regulated by the time piece, also a means whereby the globe is operated by hand for demonstrative purposes.

A.D. 1874, August 5.—No. 2712.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Edward Cliff and Richard Vose, both of the city and state of New York, United States of America.*)—" Improvements in elliptic springs."

This invention relates to an elliptic spring composed of an entire or endless elliptical hoop with auxiliary V or U shaped leaves placed interiorly at the ends of the ellipse. Also to a provision against the breaking of such interior auxiliary leaves.

A.D. 1874, August 6.—No. 2722.

NEWCOMB, Elisha, of Westbrook, in the county of Cumberland and state of Maine, one of the United States of America, mechanic.—" An improved car replacer."

This invention consists of a moveable bed placed inside one of the rails and carrying two short supplemental rails and a moevable pivotted frog adjustable by a cross bar; the ends of the supplemental rails are furnished with hooks or points which attach it to one of the cross ties of the railway. Also of a double inclined plane placed outside the opposite rail, and the upper surfaces of which shelve towards the rail. The car which has been displaced being forced forward, one of the wheels is drawn up until it rests upon one of the supplemental rails, whilst the opposite wheel at the same time rises up the double inclined plane until its flange can pass over the rail into its proper place, the moveable frog and one of the short supplemental rails guiding the opposite wheel also into its proper position.

A.D. 1874, August 6.—No. 2726.

ZADIG, Philip, of San Francisco, in the state of California, one of the United States of America.—" Improvements in the construction of pavements for roadways and for other like purposes."

My said invention consists in the employment of cobble-stones or other stones with broken or ragged points placed in a form or flask of the desired dimensions, in which position the stones are embedded in and held by asphaltum or a concrete of asphalt and gravel, the base of the block being of brick which is also held by the same material. My invention further consists in the flask or device in which the blocks are formed.

A.D. 1874, August 7.—No. 2735.

BECK, William Henry, of 139, Cannon Street, in the city of London, consulting engineer.—(*A communication from A. Bidtel, manager of the jute manufactory, Floridsdorf, near Vienna, in the Empire of Austria.*)—" Apparatus for the removal from hard feed water of those matters which form deposits or incrustations " in boilers or other heating vessels."

The invention consists in an apparatus composed of a mixer and a filter or system of filters of peculiar construction. The feed water is pumped through the mixer along with hydrates (as in the process known as Clark's method), or solutions of soda and chloride of barium in such proportions as will saturate the carbonates and sulphates contained in the water so as to convert them into a precipitate. This precipitate is then removed by filtration of the liquid through the filter, and the feed water which remains is more or less completely freed from matters which would form a deposit or incrustation in the boiler or other heating vessel.

A.D. 1874, August 7.—No. 2741.

HASELTINE, George, of the " International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Robert Henry Thurston, of Hobeken, New Jersey, United States of America.*)—" Improvements in machines for hammering or forging metals, drilling and channelling rocks, riveting, " and other like operations."

The improvements herein described have reference to certain peculiarities in the construction of the piston, the arrangement and operation of the valves, the devices for feeding, the method of holding the tool and of imparting rotation to the tool when such rotation is desirable, and certain other points which will be hereinafter noted, all arranged and combined to form an effective machine for use not only in the ordinary operations of a steam hammer used in forging, but in special work, such as in rock drilling, rock channelling, in rivetting, and in work of like character.

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[land), 319, Steam cultivators.
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[flulted rollers used in spinning, &c.
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——— (*Meaker*), 937 (*App.* 38.) Hoistway doors.
——— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep
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——— (*Larer & Griscom*), 1129 (*App.* 40.) Dressing [millstones.
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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 8 to February 14, 1874.

A.D. 1874, February 9.—No. 504.

TWIN, HENRY, of Birmingham, in the county of Warwick, manufacturer.—" Certain improvements finger boards, suitable for pianofortes, organs, harmoniums, and other such like instruments."

e novelty of my invention consists in covering the keys of pianofortes or such like instruments with er of pearl or tortoise shell instead of ivory, as now generally used, by which brilliancy of effect and arance is obtained.

A.D. 1874, February 9.—No. 505.

GUE, JOHN GARRETT, of the firm of Tongue & Birkbeck, patent agents & engineers, of 34, hampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from Julius August rich, Damkoehler, landscape painter, of Berlin, in the German Empire.*)—" Improvements in the preserva n of meat or animal substances."

is invention consists in first drying the meat at a temperature of about 35 to 60 degrees Réaumur until n coating or crust is formed all over it. It is then packed in cases containing hard dry salt, in which neat is entirely embedded.

A.D. 1874, February 9.—No. 506.

INS, FRANCIS HENRY, of 62, Fleet Street, in the city of London, engineer.—" Improvements in ters for ships' tanks and other purposes."

is invention has first for its object improvements in filters for ships' tanks by the application thereto of lified carbon filtering blocks mounted in plates or frames as described in the Specification of Letters nt granted to me dated 14th February 1873, No. 556, and also in enamelling or lining the chamber or re oir containing the filtered water with white enamelled, glazed, encaustic, or vitrified tiles or slabs, or with nelled metal plates or chambers, in order to preserve the filtered water in a perfectly pure state in any ate.

A.D. 1874, February 9.—No. 507.

CKBURN, BEWICKE, and BLACKBURN, ALEXANDER BEWICKE, of No. 1 York Buildings, Adelphi, he county of Middlesex.—" Improvements in the means and apparatus for working steam engines pansively."

is invention relates to means and apparatus for working steam engines expansively by admitting to the ing cylinder a definite charge of steam from a chamber charged from the boiler. This may be effected single slide or by separate slides or valves worked so as alternately to put the charging chambers in nunication with the boiler and with the respective ends of the cylinders.

he degree of expansion may be varied by varying the capac ty of the charging chambers by means of stable pistons worked by hand or by a governor.

he steam jacket of the cylinder, or portions thereof, may be utilised as charging chambers.

A.D. 1874, February 9.—No. 508.

RTON, WILLIAM, of the town and county of the town of Southampton, brewer.—" Improvements in e treatment of grains or malt in the production of wort."

his Provisional Specification describes the obtaining of a further extract from grains, the residues of ing, which have hitherto been considered as spent; also the employment for the purpose, of sulphuric

A.D. 1874, February 9.—No. 509.

MARCHANT, Robert Mudge, of Kirby Street, Hatton Garden, in the county of Middlesex, civil engineer. —" Improvements in motive power engines, and in apparatus connected therewith."

This invention consists in the special application and use of a combination of air, steam, and caloric as a motive power, such combination being applied to such purpose in continuous circuit of the already heated medium and in such manner that the caloric lost during the expansion of the heated air and steam in its application to effected power, either in any cylinder or other mechanical contrivance for effecting and transmitting the power, shall be restored to it again during its passage as air and steam through tubes in a heater or boiler so constructed as to facilitate its transit and the absorption by it of the heat which is communicated by the fire contained therein, after which operation it is continually reused in the cylinder or other effecter and transmitter of that power which is represented by the working pressure contained in such combination.

The invention further comprises a special heater for the purpose of reheating the highly compressed and saturated air and steam of the exhaust after its passage through the pump of the combined air, steam, and caloric engine, for each and every subsequent use in the cylinder or other application of attained pressures to the purpose of power. Also a special arrangement of valves to cylinders, by means of which the delivery and expansion of the high pressure combination of air, steam, and caloric is effected with one piston valve only, the effect being obtained at the time of most rapid travel of the valve.

A.D. 1874, February 9.—No. 510.

ESPIR, Camille, of 9, Gracechurch Street, in the city of London, continental advertising contractor.—(*A communication from Samuel Léonce Suarés, David Ferdinand Fonsēque, and Bertrand Cordes, all of* 18, *Rue de la Chaussée d'Antin, Paris, France.*)—" A new machine or apparatus for cutting down trees."

A square iron frame with circular frame beneath attached to the trunk of the tree by long radiating screws. A travelling bar with knife moves on the top of square frame; two levers attached to the circular frame for carrying it round, and with it a star like wheel which is in connection with it, and a screw and pinion movement at the side, which moves the bar and knife, and so closing in upon the trunk of the tree and cutting into it deeper and deeper at each revolution.

Manual, steam, or other power could be used as required.

A.D. 1874, February 9.—No. 511.

WELB, Horatio, of West Hill Lodge, Hampstead, in the county of Middlesex.—(*A communication from Thaddeus Hiram Walker, of Topeka, Kansas, United States of America.*)—" Improvements in sewing " machines."

My invention relates to sewing machines in which a needle and shuttle co-operate to form the stitches, and it consists in a novel construction, combination, and arrangement of parts, which have for their object to improve the operation of the machine.

A.D. 1874, February 9.—No. 512.

ADORNO, Juan Nepomuceno, of Harley Street, Cavendish Square, in the county of Middlesex, gentleman.—" Improvements in railways and in engines and carriages to be used thereon."

This invention relates, firstly, to a novel construction of the permanent way of railways.

2nd. To an improved construction of locomotive engine and boiler to be used on such railway.

3rd. To an improved steam break for locomotive engines and carriages; and

4th. To improvements in the form and construction of carriages for passengers and goods.

A.D. 1874, February 9.—No. 513.

SPARTALI, Nicholas Demetrius, of Liverpool, in the county of Lancaster, steam ship agent.—" Improvements applicable to fireplaces and cooking stoves."

For heating apartments I use the open grate and place therein a fire basket which will admit of air circulating around it. The back of the basket will be set at an incline, so as to contract the area of fuel space at the bottom of the basket. This back I line with fire clay, and immediately above it I mount a hinged plate.

A.D. 1874, February 9.—No. 514.

GOSSELIN, Louis François, of Boulevard de Strasbourg, 23, at Paris, commission merchant.—" An " improved jacket or waistcoat for swimming and saving life."

This consists in fastening india rubber tubes in a garment formed and worn like an ordinary flannel vest or jersey, so that a considerable buoyant power is imparted when the tubes are inflated. A mouth piece to enable the tubes to be inflated by blowing is provided near the neck of the garment so as to be readily accessible.

A.D. 1874, February 9.—No. 515.

REYNOLDS, William Francis, of Nightingale Lane, London Docks, in the county of Middlesex nautical instrument maker.—" Improved means of and apparatus for indicating the speed of engines."

This consists in the employment of a wire strip which can be heated by a current of electricity, and be expanded lengthwise, whereby to operate an index hand and show the number of rotations of an engine.

A.D. 1874, February 10.—No. 516.

PENDRED, Vaughan, of Crohill House, Angles Road, Streatham, in the county of Surrey, engineer.— " Improvements in the construction of boilers for generating steam."

This invention consists in using helical diaphragms or twisted metal plates inserted longitudinally in horizontal water tubes to produce circulation of water and steam, two currents being thereby established in each tube, flowing in opposite directions and always tending to rise round the helix from a lower to a higher position in the tube.

A.D. 1874, February 10.—No. 517.

ORR, John Bryson, of Glasgow, in the county of Lanark, North Britain, manufacturing chemist.— " Improvements in obtaining a white pigment, and in the process employed therefor."

The features of novelty which constitute this invention are—

First. The production of a compound or combination of barium sulphate and zinc sulphide.

Second. The chilling of the said compound or combination so as to increase its density and impart body thereto.

A.D. 1874, February 10.—No. 518.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Alphonse Joly, a person resident at Paris, Rue du Cherche-midi, gentleman*).—" A domestic fire " alarm."

The invention consists of connecting a pile with a sounding signal, by a wire wrapped with a suitable fusible insulating material, this wire being bent upon itself so that the material melting, if the fire breaks out in a room or other place where the wire passes, the two wires close each other will come in contact, the electric current will be established, and the sounding signal will give alarm.

A.D. 1874, February 10.—No. 519.

TOUAILLON, Charles Hippolyte, of Paris, in the Republic of France, civil engineer.—(*A communication from Louis Jean Paul Eugène Gaillard, a person resident at No. 72, Boulevard Sébastopol, Paris, France, D.M., surgeon-dentist.*)—" Improvements in apparatus for stopping teeth."

These apparatus consist, 1°, of a condenser formed of a handle provided at its end with a cap, on the convex surface of which a metal pin is screwed, whilst a disk of a soft material is inserted in its concave face; 2°, of pincers making up a powerful lever composed of two branches, the ends of which are cast together with the handles, and which may be of different shape or size and connected one with each other by a pin; 3°, of a percutor used for stopping the metal in the teeth, and composed of a rod sliding in a tubular cylinder and compressing a cylindrical hammer inserted in the said cylinder which strikes upon the head of this rod under the action of a spiral spring surrounding it.

A.D. 1874, February 10.—No. 520.

COX, Samuel Goodhall, of Leicester, in the county of Leicester, pharmaceutical chemist.—" An improvement in the manufacture of pills."

The object of this invention is to render the different varieties of opaque coated pills easily distinguishable.

The pills are coated preferably with a compound of French chalk and any suitable adhesive substance, or of sugar, and on this coating are stamped, fixed, printed, or otherwise formed, letters, figures, or symbols, such letters, figures, or symbols denoting the kind or quality of the pill.

A.D. 1874, February 10.—No. 521.

BALE, Frederick, of Coventry Hospital, in the town of Droitwich and county of Worcestershire, government science teacher.—" Improvements in the manufacture and production of common salt, and in the apparatus employed therein."

This invention has for its object improvements in the manufacture and production of common salt, whereby a great saving in time and expense will be secured.

This is accomplished by bringing the salt cake and alkali manufacture into the common salt making districts, and passing the hydrochloric acid evolved into the brine, and thus precipitating the sodic chloride or common salt.

A.D. 1874, February 10.—No. 522.

McFEELY, Michael, of Clandy, Co. Londonderry.—" An improved process of combining 'charger and 'heater' in the manufacture of spirits, to lessen the consumption of coal."

The worm of the still passes through the interior of the "*charger and heater*" in a circuitous manner, making a few revolutionary turns therein; and from thence to the worm-tub in the usual way. The man-hole door of the "*charger and heater*" is made perfectly steam tight; and must hold considerably more than the still connected therewith. From condensing the alcoholic vapours passed through the worm, the temperature of the wash or low-wines is increased to near the boiling point, at the time the still has ran off its charge; and from which it is re-charged after the spent wash is drawn off the stills; this process is repeated until the end of the distilling period.

The importance of this invention must be self-evident to any political economist, as having the tendency of lessening the consumption of coal, which threatens us at present as a national calamity, from the enormous advance in its price within the last few years.

The stills according to this improved principle can be re-charged with liquor nearly boiling, instead of cold liquor as at present, clearly shewing a vast saving in coal.

A.D. 1874, February 10.—No. 523.

LIGHBODY, Alexander, of the city of Edinburgh, North Britain, and **LIGHBODY, William**, of Bow, in the county of Middlesex.—" Improvements in lamp burners."

This invention consists of an improved wick tube, principally applicable to paraffin lamps, made of an angular or zig zag shape, whereby a greater breadth of wick within the same diameter of socket is obtained.

A.D. 1874, February 10.—No. 524.

GOLD, Robert Symington, of Leamington, in the county of Warwick, clothier.—" Improvements in hats."

My invention of improvements in hats consists in adapting to the inside of felt and other hats an ornamental tip, consisting of a mirror mounted in an ornamental frame, made by preference of thin metal stamped up and supported in place in the hat by two spring arms, which when bent down assist in supporting the sides of the hat to which they are secured by means of eyelets, which being perforated act as ventilators to the hat.

A.D. 1874, February 10.—No. 525.

DELÉON, Joseph, of Boulevard de Strasbourg, No. 23, at Paris.—" Improvements in the manufacture of building materials and other similar products."

This consists in producing imitation stone, marble, brick, as well as tiles and ceramic blocks of all kinds, by a composition of powdered lime-stone and sand with magnesia, chloride of magnesium, and carbonate of soda. These being all well mixed are moulded into the form desired, when the three last-named ingredients react chemically and the whole mass becomes firmly aggregated.

A.D. 1874, February 10.—No. 526.

.EY, GEORGE, of Eccles, in the county of Lancaster.—" Improvements in machinery or apparatus itting and dressing stone or other similar material."

nprovements consist principally in the combination of a revolving table or face plate (on which the other similar material to be cut or dressed is secured) with a headstock carrying a revolving tool or which a slowly advancing motion is given.

A.D. 1874, February 10.—No. 527.

, DAVIE, and EYTH, MAX, both of the Steam Plough Works, Leeds, in the county of York.— vements in machinery for towing by fixed ropes."

nvention appplies to the system of towing, in which a rope is laid along the bottom of a canal or ay, and is picked up by a tug boat which winds its way along it; and the invention relates to f preventing the tow rope from drawing in close to the inner sides of the curves which occur in the f the canal or water way.

A.D. 1874, February 11.—No. 528.

S, ALEXANDER STEWART, of Old Ford, in the county of Middlesex, accountant.—" Improvements ecking the amounts taken as fares by conductors of tramway cars, omnibuses, and such like vehicles."

pecification of this invention describes checking the amounts taken as fares by the conductors of cars, omnibuses, and such like public vehicles, by giving to each passenger soon after taking his ipped ticket marked with the amount of his fare, which ticket he deposits in a locked receptacle emptied by the conductor's employers at the end of the day, when the number of such tickets, with those remaining in the possession of the conductor, must make up the total number received n the morning.

A.D. 1874, February 11.—No. 529.

, JEAN, of 70, Bayham St., Camden Town, in the county of Middlesex, manufacturer, and ON, JOSEPH, of Liege, Belgium, also manufacturer.—(*A communication from the late L. J. s, of Naestricht (Holland).*)—" A new or improved non conducting composition or mastic for preg the radiation of heat from boilers and other similar apparatus."

vention consists in coating or covering the outside of heat-containing apparatus such as steam locomotives, fixed engines, cylinders, pipes, and connections, and all other kind of machinery with a ducting composition or mastic.

A.D. 1874, February 11.—No. 530.

JOSEPH THEODORE, of 43, Cowley Road, North Brixton, in the county of Surrey, civil engineer.— *unication from Alexis Gervais, of* 118, *Rue de la Roqnette, Paris, in the Republic of France, gentleman.*) rovements in the manufacture of cooking utensils."

table vessel containing an interior casing fitted with a firegrate and communicating with a flue, designed to be heated with charcoal or other flameless fuel, surmounted by one or more other or performing several culinary operations simultaneously. Adaptation for military, naval, and field .

A.D. 1874, February 11.—No. 531.

TON, WILLIAM, of Lima, Peru, but at present residing at 47, Lincoln's Inn Fields, in the county esex, engineer.—" Improvements in machinery or apparatus for compressing air or gases."

tus for compressing air by the employment of a series of cylindrical chambers of diminishing , each being partially filled with water, mercury, or other fluid, which by the oscillation of the said l chambers on a fixed axis acts as a piston or pistons, and by means of suitable valves and condrives the air in an increasing compressed state through the whole series of chambers into the last ng vessel, from which it passes through the axis of the apparatus to be used as required.

A.D. 1874, February 11.—No. 532.

LYNDE, James Henry, of Sale, in the county of Chester, civil engineer.—" Improvements in tram-" ways."

My invention consists in the combination of a metallic grooved rail with cement, concrete, or asphalte. This invention is more suitable for paved streets, but can also be applied to macadamized roads. The rail is provided with a small projection on each side at its base to form a key or dovetail, and it is joggled horizontally at the ends to render it still more secure.

A.D. 1874, February 11.—No. 533.

WILES, John Fletcher, of Sun Court, Cornhill, in the city of London.—" Improvements in means or " apparatus for propelling ships and other vessels."

The invention consists in the employment of a hollow shaft on the end of which is fixed a hollow boss having slots or openings cut or formed therein; rotary motion is given to this shaft, and water is forced through it so as to issue from the slots in the hollow boss.

A.D. 1874, February 11.—No. 534.

WILSON, Matthew, of Crawshay Road, Brixton, in the county of Surrey, gentleman.—" Improvements " in stench-traps."

I construct my improved stench-trap with a bell or cup, which is separate from the perforated cover or grating of the trap, and is secured in the box or body of the same. I also in some instances provide my improved stench-trap with a ball of cork or other suitable material, to more fully ensure the sealing or closing of the pipe.

A.D. 1874, February 11.—No. 535.

RENDER, Frederick, of Manchester, in the county of Lancaster, corn merchant.—" Improvements in " apparatus for elevating or transferring wheat and other such grain from ships or other vessels, or from " other situations."

This invention consists in transferring grain by a current of air caused to pass through a tube.

A.D. 1874, February 12.—No. 536.

KIDDILL, James, the younger, of Hertford, in the county of Herts, metal-worker.—" An improved " fountain for use in game-preserves, poultry-yards, aviaries, and other places."

This invention consists in improvements in the construction of fountains for use in game-preserves, poultry yards, aviaries, and other places, whereby such fountains are rendered much more portable than those hitherto in use; they are more easily filled and emptied; the rapid accumulation of twigs, leaves, and dirt in the water trough, and the fouling of the water by small birds washing therein, are avoided, and the risk of fracture of the fountains from the congelation and expansion of the water they contain is greatly reduced.

A.D. 1874, February 12.—No. 537.

HARRISON, John, **LOYND**, William, and **CLAYTON**, Richard Henry, of the firm of Clayton, Goodfellow, and Company, of Blackburn, in the county of Lancaster, engineers.—" Improvements in air-" pumps or vacuum engines."

The inventors open the inlet-valves of air-pumps by positive motion, as, for example, the valves are closed by springs and opened by levers actuated by eccentrics or cams on the crank-shafts of the engines.

A.D. 1874, February 12.—No. 538.

CAMPBELL, John, of London, in the county of Middlesex, iron merchant, and **SOMERVILLE** Wallace Cochrane, of Clapham, in the county of Surrey, civil engineer.—" Certain improvements " applicable to mortar mills or to other grinding mills of a similar nature and to road rollers."

In carrying our invention into practice we mount each runner or roller or each part thereof on a separate centre (provided, if desired, with friction wheels) around which it rotates, but these centres we prevent having movement therewith, and we apply them so as to be capable of movement in a vertical direction only, by

them hollow, and contracting, shaping, or forming their ends with an elongated vertical flat sided
rough which we pass a fixed cross square-shaft, fitting the slots crossways and connected at each end
side standard.
hus allow each centre and its runner or roller, or part thereof to have an independent motion (instead
orking round a single fixed turned cross shaft as hitherto) in a vertical direction, so that it can rise
and adapt itself to any obstruction or irregularities in the substance of the material upon which it
s.
centres may be provided with exterior flanges to exclude dirt or other extraneous matter from the
s.

A.D. 1874, February 12.—No. 539.

WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings,
.—(*A communication from David Harris, of St. Louis, Missouri, United States of America, boot and
ker.*)—"An improved apparatus for stretching boots and shoes."
object of this invention is the provision of a simple, ready, and efficient machine, whereby the stretching
, shoes, and the like, is accomplished combinedly for all the parts of the boot or shoe proper, or in-
ently at any desired part of same.

A.D. 1874, February 12.—No. 540.

KBURN, THOMAS, of Mellor, near Blackburn, in the county of Lancaster, manufacturing chemist.—
vements in the manufacture of size."
nvention consists in combining chloride of zinc or any other suitable salt of zinc or salts of alumina
nesia, caustic potash, sulphite of soda or potash and water, either with or without farinaceous matter
a clay, or soap stone, or gum, or glue, or other adhesive substances.

A.D. 1874, February 12.—No. 541.

OW, BENJAMIN, of Macclesfield, in the county of Chester, ironfounder and engineer.—"A new
proved potters' or earthenware printers' stove or hot plate, and method of heating the same."
eatures of novelty in this invention consist in the use and application of a metallic casing sur-
d, except on its flattened top, with a jacket filled with felt or other bad conducting material, and into
casing steam or hot water under pressure is introduced, and thus forms the heating medium for
the colour and engraved copper plates used by potters in printing upon china or earthenware.

A.D. 1874, February 12.—No. 542.

IOU, LOUIS HYACINTHE, 148, Great Portland Street, in London.—"A new system of buckles without
gs, with a pressure in continuity through a movement of friction."
buckle is applicable to every kind of strings, belts, & bandages.
pieces compose the buckle, the frame & the enclosure (or plate).
frame is pierced with two holes to adapt in them the enclosure (plate).
plate when opening is subject to a friction at the bottom of the sides through their contact with the
ides.
mechanical movement compels the plate to fall down to the frame.
buckle can be opened entirely that plenty room may be given to the passage.
e opening, the transversal bar of the frame is conical & the bandages being pressed upon this by
e, which itself obeys to the law of friction.
buckle is made either in iron, or in copper, or in any metal.

A.D. 1874, February 12.—No. 543.

N, ANDREW, of Liverpool, in the county of Lancaster, civil engineer, and **BURNS**, JOHN, of the
lace, stevedore.—"An improved stud or fastening for securing the ends of bale bands."
object here is to provide a stud which (1) can be easily and quickly applied; (2) shall efficiently
the perforated ends of bale bands; and, (3) allow of easy disconnection without compression or

ends of the band have oblong or elongated perforations.

Each stud has (A) an inner head (B) a stem of length equal to the thickness of the two overlapping ends of the band to be connected, and (C) an outer head passing from the stem at a right angle in one direction. When fastening a band the free end of the outer head stands pointing towards the free overlapping end of the band. To release the ends of a band it is simply necessary to turn the outer head of the stud in the opposite direction and slip the outer end thereover.

A.D. 1874, February 12.—No. 544.

HICKS, John, Tower Station, 57, Pevensey, Eastbourne, in the county of Sussex, mariner coast guard. —" Improved apparatus for saving life at sea."

The apparatus is composed of air-tight tubes secured together at each end, and formed of thin battens or strips of wood, or of cork and wood, or iron, cork, and wood combined, the same being constructed in watertight sections or compartments, and coated with marine glue. The tubes thus formed are then covered with canvas and cork, and coated with paint or other waterproof composition. Wooden platforms are secured to the upper and lower portions of the tubes, which latter are arranged parallel to each other at any suitable distances. The platforms are respectively covered with a strong rope netting which is adapted to support the persons who are on the apparatus. A ridge rope and netting are attached by means of stanchions to the edges of the apparatus.

A.D. 1874, February 12.—No. 545.

LEBER, John, of Goswell Road, Clerkenwell, in the county of Middlesex.—" Improvements in the " construction of machines for cutting paper and pasteboard."

This invention consists in attaching or connecting a spring or weight to a projection on the end of the cripper-bar opposite to that side of the machine at which the treadle is situated. Such spring or weight is connected with a bracket fixed to the frame of the machine. The end of the cripper-bar works in a socket or slot formed in a vertical bar, and the cripper-bar, whenever the pressure of the foot is removed from the treadle, rises sufficiently high, by the operation of the spring or weight, to push any desired quantity of material into the requisite position for being cut.

A.D. 1874, February 12.—No. 546.

DUNCAN, John Thomson, of Glasgow, in the county of Lanark, Scotland, accountant.—(*A communication from Thomas Sterry Hunt, of Boston, Massachusetts, in the United States of America.*)—" Improvements " in precipitating metallic copper from its solutions, and in obtaining a utilizable material from the agent " employed for the purpose."

Tin plate, scrap, or waste is used for precipitating copper from its solutions, and the adhering tin is saved. The copper solutions contain protochloride of copper and a sulphate of soda or other base. The tin is recovered by its solution and precipitation as an oxide.

A.D. 1874, February 12.—No. 547.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Henri Robert, of Paris, France.*)—" A new or improved kind of clock."

According to this invention the "going" train is mounted on the hands or on one of them, eccentrically to their centre of rotation, and so as to be concealed from view.

The clock is furnished with a transparent glass dial, and appears to work without the aid of any mechanism.

A.D. 1874, February 13.—No. 548.

VOSPER, Charles Walter, of Stoke Devonport, in the county of Devon, agent.—" Improvements in " shuttles applicable to all kinds of sewing machines worked by a shuttle."

The substitution of tongues in lieu of the holes formed in shuttles, whereby a proper and equal tension is secured and allowing the operator to sew with worsted. Also the forming of a clasp on the inside of the shuttle to prevent the thread or other material from slipping off the tongues, and will be hinged at one end and made easy to move for inserting the thread on the tongues.

A.D. 1874, February 13.—No. 549.

LAUTH, Bernard Charles, of Pittsburgh, Pennsylvania, United States of America, now of No. 8, Southampton Buildings, London, civil engineer.—(*A communication from Robert Sleath, of Pittsburgh, aforesaid.*)—" Improvements in the manufacture of cast-metal rolls, pipes, wheels, and other like articles, " chiefly applicable to the manufacture of rolls and other parts of machinery for rolling metals."

I manufacture metal rolls, dies, roll pinions, wheels, and other articles of cast iron and steel combined, and thereby impart to them strength and hardness of surface.

A.D. 1874, February 13.—No. 550.

PERKS, Thomas, the younger, of the firm of Thomas Perks and Sons, of Birmingham, in the county of Warwick, jewellers.—" Improvements in brooches, shawl pins, nursery pins, and other like fastenings."

This invention consists in securing the pin or arm of the brooch or other article, and protecting the point of the pin by the following combination of parts. On the back of the brooch or article where the usual loop is situated, a barrel or tubular case is fixed into a slot, in the side of which the pin is passed by a lateral motion. A second barrel or tube works in the fixed barrel or case. By sliding inwards the said second barrel, it closes the slot in the fixed barrel and fastens the brooch, and by surrounding the point of the pin protects the said point. By drawing back the sliding barrel, the point of the pin and the slot in the fixed barrel are uncovered, and the said pin may be removed for unfastening the brooch or other article. The slot may be in the upper side of the fixed barrel, and the sliding barrel may be secured by a bayonet joint fastening.

A.D. 1874, February 13.—No. 551.

BUCKINGHAM, William, of Coventry, in the county of Warwick, smith.—" Improved heating " apparatus for buildings, dwelling houses, also for steam boilers, or any such like purpose or purposes."

The apparatus consists mainly of a series of square, round, or other shaped fire-boxes, which are placed at suitable distances apart and connected by continuous inlet and outlet pipe flues of metal or other suitable material.

Each of the said fire-boxes is provided with a movable lid having a small central draught hole or aperture through which the vitiated air is drawn from the room or apartment to feed the fire within the box.

Within each box is placed a grating upon which the fuel for combustion rests.

The fuel is firstly ignited at its top, and is caused by the downward draught to burn continuously downwards, in which direction the draught carries all the smoke arising from the combustion through the lower portion of the fuel and through the pipe flues from the one fire-box to the other.

When the apparatus is placed under the floor line, the heating or warming is effected by the upward radiation of heat from the fire-boxes and pipe flues through continuous gratings placed in the flooring above them.

The above arrangement may be laid in all respects as hotwater apparatus, and may be applied to the interiors of boilers for the generation of steam, in lieu of the ordinary multitudinous tubes or flues.

A.D. 1874, February 13.—No. 552.

GOATER, John, of Clarence Cottage, South Street, Ponders End, in the county of Middlesex, mechanic. —" Improvements in arranging and combining the materials used in the manufacture and construction of " fire and burglar proof safes, strong boxes, and other receptacles, and the parts connected therewith."

Forming tenons, dovetails, or projections on the sheets or plates of metal employed to make safes, strong boxes, or other receptacles; and causing the said tenons or projections to enter " bell mouthed " or dovetail slots, mortices, or openings formed in L or angle shaped pieces or parts of metal placed on the interior of the safes, strong boxes, or other receptacles, into which slots, mortices, or openings, the said tenons or projections are hammered or otherwise caused to fill the said slots, mortices, or openings.

Employing a grooved bar or bars of metal, provided with a bearing or pivot at each end working in the framework of the safe, strong box, or other receptacle, which have a rotary or partially rotary movement on opening or closing the door on the said pivots or bearings, the edge or edges of the door entering the said groove; and when the door is closed the edge or edges of the same is or are embedded in the said grooved bar, and the outside edge or edges overlaps or overlap the door, thus firmly closing the opening or openings between the edge or edges of the door and the frame, and opposing a solid resistance to the wedge, lever, or other implement.

Placing pieces of granite, flint, slag, copper dross, steel, chilled cast iron, or hard material of a convenient size and form, in a casing, and running into and amongst them molten metal; or applying concrete, cement, iron cement, or other suitable substance or substances, to cause them to keep together in a mass, and placing the said casings as a lining for the interior of the safe, strong box, or other receptacle, so that it shall not be in direct contact all over with the shell of the safe or receptacle, but shall have a certain yielding action on the application of intermittent pressure so as to recede from and spring back to its normal position.

Forming the cap of the lock of a combination of hard and soft metals, or hard metal; or arranging lock so as to form a receptacle for the same.

Placing a part on the stump of the lock tumblers, which enters a notch or notches in the slot of the bolt and prevents picking.

Employing low heat conducting material, such as portland cement, roman cement, Keene's cement, for fire proofing; and placing the alum, soda, or other steam generating substance or substances in boxes or cases of wood, papier maché, card board, or other suitable material, or in boxes or cases of thin sheet iron, tin, or other suitable material, perforated or otherwise, so arranged as to allow the ready escape of the steam or vapour when heat obtains access, and placing these said boxes or cases in their places, surrounded with and covered by the cement or other materials used for resisting heat.

A.D. 1874, February 13.—No. 553.

POCHET, Henry, of Rue Jean Jacques Rousseau, No. 66, at Paris, manufacturer.—"An improved bottle stopper and drinking vessel combined."

This consists of a combined drinking glass and stopper. The glass is provided in its bottom with a slightly conical nipple or projection which, when the glass is placed over the neck of the bottle, becomes the stopper and presses against a ring or washer of cork or rubber squeezed into the entrance of the neck.

A.D. 1874, February 13.—No. 554.

NOBLE, Andrew, Captain, late of the Royal Artillery, now of Elswick Works, Newcastle upon Tyne.—"Improvements in the mode of giving rotation to projectiles and stopping windage in ordnance."

These improvements consist of a method of expanding a soft metal ring attached to the base of the projectile so as to force it into the grooves of the gun.

A.D. 1874, February 13.—No. 555.

CLEGG, John, of Oldham, in the county of Lancaster, and TAYLOR, Robert, of the same place, machinist.—"Certain improvements in mules and twiners for spinning and doubling."

Our invention refers to the winding motion of self-acting mules and twiners, and it is designed to give an increased speed to the spindles during the formation of the cop nose. To accomplish this we use a tapering scroll fixed on the end of the winding drum; one end of the winding chain is fastened to the smallest portion of the tapering scroll; and then after passing over a bowl attached to a slide fitting on the quadrant arm, it is secured to the quadrant nut.

A.D. 1874, February 13.—No. 556.

HAIGH, William Blackett, and BLEASBY, Adam, of Oldham, in the county of Lancaster.—"Improvements in furnaces or cupolas used for melting iron and other metals."

This invention relates to those furnaces or cupolas having receivers or chambers into which the metal runs as it is melted; and in the furnaces used at present the flame and heat passes from the receivers through a pipe or flue to the atmosphere.

The present invention consists in dispensing with the pipe leading to the atmosphere, and fixing to the receiver near the cupola or furnace one or more vertical taper pipes, to which are fixed one or more horizontal or inclined pipes leading to the interior of the cupola or furnace into the coke above the tuyeres, by which means the heat which was before lost assists to a great extent in melting the metal, and at the same time the interior of the cupola is kept cleaner, and the nuisance which at present arises from the escape of the heat through the pipe open to the atmosphere is entirely prevented, as by this invention the heat is returned into the interior of the cupola or furnace.

A.D. 1874, February 13.—No. 557.

NANGLE, Walter Chidiock, of Bull Point, near Devonport, Cy. of Devon, late Captain Royal Artily., Assistant Controller, Bull Point Establishment.—"Improvements in the composition and preparation of "preservative and antifouling compounds or paints for coating metals and other substances."

This invention relates to that class of compounds known as "anti-fouling." These compounds are rendered tough by an admixture of tanning substances with tallow or oil and resin; astringent and drying properties are given to them by an admixture of iron ore and other mineral substances, and they are rendered powerful enemies to vegetable and animal marine substances by the incorporation of carbonate of barytes, aloes, and various other substances.

A.D. 1874, February 13.—No. 558.

SHEDLOCK, James John, of Harrow Road, Paddington, in the county of Middlesex, engineer.—"Improvements in apparatus for containing pigments, inks, gums, and other like materials."

My invented relates to the construction of a simple and convenient apparatus in which may be combined any required number of vessels or compartments containing solid or liquid pigment or colour, ink, gum, sand, and other like materials. By having these materials contained in one compact apparatus or article I avoid the inconvenience of having on a table or desk where such materials are used a number of separate inkstands, pallets, bottles, and other vessels scattered about and liable to be misplaced, overturned, and broken.

A.D. 1874, February 14.—No. 559.

MELDRUM, Edward, of Dechmont, in the county of Linlithgow, North Britain, gentleman.—"An improvement in open fireplaces."

The feature of novelty which constitutes this invention is the double casing for enclosing an air space round the surfaces, which are heated by contact with and by conduction and radiation from the fuel.

A.D. 1874, February 14.—No. 560.

DALZELL, John Brown, of Lesmahagow, in the county of Lanark, North Britain, merchant.—"Improved "signalling apparatus for railways."

The feature of novelty which constitutes this invention is the lever and its connections for actuating sound signals in combination with sight signals on railways.

A.D. 1874, February 14.—No. 561.

THOMPSON, Nathan, of the city of Brooklyn and state New York, in the United States of America, but at present of 23, Southampton Buildings, in the county of Middlesex, marine engineer.—"Improvements "in means for stopping bottles, jars, and other hollow articles, which invention is applicable to means for "connecting together tubes and other articles."

The invention consists in the employment, with stoppers or covers, of a clip or strap which passes over the top of the stopper or cover, and takes a bearing against the underside of a flange on the neck or end of the article to be stopped; a lever formed with an offset or offsets being employed to act against the crown of the stopper or cover. Or instead of employing levers in connection with the clip or strap, a staple, the legs of which pass between the flange on the neck or end of the article to be stopped, and the legs of the clip or strap may be employed.

A.D. 1874, February 14.—No. 562.

SMITH, Alfred, of Number 178, Stockport Road, in the city of Manchester, in the county of Lancaster, manufacturing chemist, and **HANNAM**, George William, of Hornby Lodge, Prestwich, in the said county of Lancaster, merchant—"Preparing peat for various uses and purposes by washing, straining and "precipitation."

To make a preparation of peat for various uses and purposes by washing, straining and precipitation;

A.D. 1874, February 14.—No. 563.

TERREY, Charles Andrew, of St. George's Road, Southwark, in the county of Surrey, engineer.—"An "improved method of setting diamonds in drills and other boring and cutting tools."

This invention relates to a novel method of setting diamonds in drills and other boring and cutting instruments, and consists in providing the drill or other tool with a cap, in one piece or several sections, said cap following exactly the form of the drill or other tool; the holes for the reception of the diamonds are made in this cap, tapering from its inner to its outer surface, so that when the diamonds are placed in these holes with their greater diameters in the inner side of the cap, and the cap is screwed or otherwise fixed on the body of the drill or tool, they cannot possibly fall out unless the diamond or the tool be actually broken, and in such case can be replaced by a diamond of the same size, instead of necessarily by a larger one, as required in case of ordinary setting.

A.D. 1874, February 14.—No. 564.

CLARK, Josiah Latimer, and HILL, Edward Jacob, both of Victoria Street, in the city of Westminster.—" Improvements in railway signalling apparatus."

The invention relates to improved mechanism for giving an audible signal on a locomotive, consisting of a swinging bar or trigger hung from the engine to effect contact with an arm standing up between the rails, and so release a weighted lever connected with the whistle or a gong. The driver in shutting off the whistle raises the weighted lever to a horizontal position and again connects it with the trigger, in readiness for giving a fresh signal. The device on the track for tripping the trigger is worked in connection with the distant signal or by an independent wire.

A.D. 1874, February 14.—No. 565.

HAZELDINE, Frederick, of Lant Street, Borough, in the county of Surrey.—" An improved valve or " tap for liquids and other purposes."

The feature of novelty of this invention consists in constructing a valve by means of a hinged plate forced against its seat by a screw fitting into a slotted groove and working through the outer casing of the valve.

A.D. 1874, February 14.—No. 566.

BOX, William Williams, of the Gas Works, Crayford, in the county of Kent.—" Improvements in " apparatus used in the manufacture of gas."

The object of this invention is to render unnecessary the use of liquid in what is now called the hydraulic main, and consists in constructing the cap at the top of the dip-pipe with a stuffing box, through which passes a spindle, which is attached at one end to a lever supported on a fulcrum, and provided with a counterbalance weight, while the other end of the lever is extended to any convenient length, and is operated upon by a chain or rod. The other extremity of the spindle is fastened to a hollow conical valve made with a flange or projection at or near its base, the flange being turned true. The bottom of the dip pipe is also turned true with a V shaped or other suitably formed edge. The cone and dip pipe are thus made into a valve, which may be opened by pulling down the rod, and closed by the counterpoise when the rod or chain is released.

A.D. 1874, February 14.—No. 567.

RICHARDS, William, of Burton Road, Brixton, in the county of Surrey.—" Improvements in regulating " the supply of fluids and liquids for the manufacture of illuminating gas, and for the apparatus employed " therein."

The first part of the invention refers to regulating the supply of water or steam or controlling the production of hydrogen and other gases commonly known as " water-gas " when used for combination with gas derived from the distillation of liquid hydrocarbons.

This is effected by the use of suitable cylinders and pumps worked by steam or water, and made to deliver regular and proper quantities of steam and hydrocarbons to the respective retorts, whereby gases will be evolved, which on being brought together and combined, will form a gas of uniform illuminating power.

The second part of the invention relates to the supply of water or steam for the production of gases to be mixed with gases derived from the distillation of solid hydrocarbons. This is effected by a pump or pumps connected with the station meter shaft, which, as it revolves, pumps the necessary quantity of water or steam into the retorts to produce the requisite hydrogen to be used as a diluant.

The third part of the invention relates to the supply of hydrogen or water gas, by means of pumps by steam, water, or the station meter, so as to deliver the hydrogen at the bottom of a carburettor, aid hydrocarbons are supplied at the top of the same vessel.

urth part of this invention consists in the application of duly proportionate cylinders and pumps urpose of pumping and forcing atmospheric air and liquid hydrocarbons into carburettors when air the place of hydrogen or " water gas."

A.D. 1874, February 14.—No. 568.

T, **Alexander Frederic**, of Doncaster, in the county of York, Lieutenant-Colonel in Her Bengal Staff Corps.—" Improvements in the production of artificial fuel."

el is composed of 5 lb. by weight of powdered charcoal, 6 lb. clay or clayey earth, 1 gallon of liquor h 6 or 7 lb. dried cattle dung or peat have been stirred.

ingredients are added and mixed separately and formed into a stiff paste mortar like, and shaped or moulded and dried.

A.D. 1874, February 14.—No. 569.

Dillwyn, and HENDERSON, **Thomas**, both of Liverpool, in the county of Lancaster, and SON, **William Phillips**, of Birkenhead, in the county of Chester.—" Improvements in appa- or supplying fuel to steam-boiler and other furnaces."

id invention relates to improvements in the apparatus for automatically supplying fuel to steam- l other furnaces described in the Specification of Letters Patent granted to the said Dillwyn ay 16th, A.D., 1870, No. 1406, and to the said Thomas Henderson, the 23rd August, A.D., 1872, . The distinguishing peculiarity of this apparatus is the combination of fans or series of rotating hich drive the fuel into the furnace with feeding and crushing apparatus which delivers the fuel in r condition to the said fans or beaters.

A.D. 1874, February 14.—No. 570.

Villiam Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, —(*A communication from James Wilson, of Kingston, Canada, gentleman.*)—" Improvements in -wheels for steam-boats."

nvention relates to a propelling wheel for steamboats and in which the buckets are attached to an pron driven by the ordinary driving shaft of the engine, the said apron operating over wheels frame secured to the sides of the vessel, the apron wheels having projections which engage with the ning the apron chain.

A.D. 1874, February 14.—No. 571.

RY, **Henry Saunders**, of Taunton, in the county of Somerset.—" Improvements in seed and drills or distributors."

mprovements mainly consist in enabling the levers of seed drills or distributors to be pressed with appliance as they are raised with, and also of spring manure box.

A.D. 1874, February 14.—No. 572.

R, **William**, of Knockcloughrim, Castledawson, in the county of Londonderry, Ireland, and SON, **Charles**, of Retford, in the county of Nottingham.—" Improvements in flour dressing by of improved mechanism."

mprovements in flour dressing by improved mechanism relate to the use for the above purposes of ved mechanism, that is silk flour dressing machinery of peculiar construction and arrangement, he objections attendant on the ordinary machines known as " bolting " machinery are obviated, ction of same regulated. By these improvements the revolving screen is brought on a level or l, and contains a screw which causes the meal and flour to move slowly along and pass round the nce for every eighteen inches in length. The screen is made moveable by being attached to an r rod with a moveable screw and nut at the end of the machine, whereby it can be so regu- give or take more pitch according to the number of stones the machine has to dress for, and at of the miller. Another screw or worm under the machine takes the flour away as well as the our and bran to any required place. The feeding of the machine with the meal or ground wheat fected by means of an elevator, or, if preferred, the machine may be made to feed itself. A fan ent and other appliances are described.

A.D. 1874, February 14.—No. 573.

MIRFIELD, Matthew, of Tong, near Bradford, in the county of York, worsted top maker, and SCOTT, John, of Tong, aforesaid, manager.—" Improvements in machinery employed for combing wool and other " fibres."

This invention relates to that class of combing machinery where smaller circular combs revolve within or without a large circular comb, and consists in this:—That after the noil has been removed from the end of the tuft by the revolving action of the comb, a wheel, or other suitable apparatus, we feed the end of the tuft with the noil thus removed or to a small circle, and after a sliver has been drawn therefrom, we plough out and refeed the fibre thus left, on to the large and small circles at the tangent point of the two circles, thus subjecting the short fibre to further processes of " recombing," whereby the process of " recombing " by being operated upon by an additional machine is entirely obviated.

A.D. 1874, February 14.—No. 574.

KNOWLES, John, of Bolton, in the county of Lancaster, cotton spinner.—" Certain improvements in " machinery or apparatus for preparing cotton and other fibrous substances."

My invention consists in improved machinery or apparatus for collecting the dust and fluke that accumulates on the top rollers of the drawing rollers of machines for preparing cotton and other fibres. The machinery or apparatus consists of an endless band passing over a roller and a rail, and of a vibrating comb which strips the dust and fluke, also in the mode of driving the band and comb.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

ridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 8 to August 14, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, February 16.—No. 578.

OLDEN, Edward, of the firm of Isaac Holden and Sons, of Bradford, in the county of York.—"Improvements in preparing wool and other similar fibres for the combing process."

The object of the invention is to separate the longer from the shorter staple of the fibre in the processes preparing before such fibre is finally combed, so that in such final combing, the longer and the shorter res may be separately operated upon.

For this purpose the fibre for the final combing is prepared by the use of comb teeth of any suitable kind, to which it is fed, and from which it is drawn by two or more sets of drawing off rollers applied at rious distances from the carrying or holding combs.

The different distances of the respective drawing off rollers will be varied to the length of staple of fibre r the time under operation, so that the longer fibre only may be drawn off by one set of drawing off llers, and the shorter fibre only by another or other sets.

In drawing off, the longest staple is generally accumulated on an endless apron before removing it for e final combing, as described in the Specification of Letters Patent dated the 31st of March 1873, o. 1184.

The shorter fibre may be accumulated in the same way, or treated by carding and gilling before final mbing.

The improvements also relate to preparing the fibre by straightening it before combing it, by feeding it to gill comb teeth which conduct it to between nipping surfaces, and these then conduct it to porcupine such like teeth applied at an angle to the axis of a roller, and these porcupine teeth, aided by an endless ron, conduct the fibre to other gill combs to be further straightened, or in place of the porcupine teeth e nippers may conduct the fibre direct to the second set of gill combs.

A.D. 1874, February 16.—No. 580.

APIER, John David, and NAPIER, Robert David, of Glasgow, in the county of Lanark, North ritain, engineers.—"Improvements in winches and other hoisting or hauling machines."

In the improved winches or cranes the third-motion shaft is turned in the same direction whether the igle-purchase or the double-purchase is in gear; and this is attained by gearing the third-motion shaft to e second-motion shaft for both purchases. The wheels on the third-motion shaft are fitted thereon with ction clutches of the differential kind described in No. 299 of 1867. In traveller cranes two differential ction clutches are fitted on the driving shaft. One of these clutches is arranged so that when in gear the ation of the driving shaft brings the tightening action into play; but the other is arranged reversely, so at the rotation of the driving shaft tends to slacken it.

A.D. 1874, February 17.—No. 591.

AUREPAIRE DE LOUVAGNY, Ludovic Reine Raoul, Comte de, of Boulevard de Strasbourg at Paris.—"Improvements in purifying alcohol, and in the apparatus employed therein."

This consists chiefly in purifying alcohol, while being distilled, of its etherous impurities by making use the fact that ether volatilizes at a lower temperature than alcohol. Air is pumped into a boiler con- ning the alcohol to be purified, raised to such a heat that the ether is volatile while the alcohol remains ed, and the air bubbling through the liquid carries off the ether.

A.D. 1874, February 17.—No. 597.

INHEIM, Felix, of No. 43, Ampthill Square, in the county of Middlesex.—(*A communication from Arnold ffler, A. Schmittzehe, and Friedrich Klett, of Stuttgart, in the German Empire.*)—"Improvements in lithographic presses."

This invention relates to apparatus for lithographic printing of the kind in which the sheet is drawn with the stone or plate under a pressing rubber, the object of the improvements being such mechanical connection of the various movements that all are worked from one rotating shaft. The table, on which the stone or plate is adjusted to level by set screws, is caused to reciprocate on runners by the action of a crank; the rubber is raised and lowered by the action of a cam which can be adjusted in its dwell to suit different lengths of sheet; the inking is effected in the ordinary way; moistening rollers are raised and lowered by connection with the rubber; and a tympan sheet with tapes is also worked by the rubber movement. A registering cylinder may be applied for feeding the sheets, such cylinder moving in gear with the table in one direction, but resting while the table returns, and having grippers opened and closed by a cam action for taking the sheet from a feed table furnished with oscillating register needles, and applying it to the stone or plate, so that it may be carried therewith under the rubber.

A.D. 1874, February 18.—No. 602.

GRIFFITHS, George, of Birmingham, in the county of Warwick, sewing machine shuttle and materials manufacturer.—" Improvements in sewing machine shuttles and reels."

According to this invention the yielding or elastic centre of the shuttle in which the end of the reel spindle is supported is made of a flat convolute spring resembling a watch spring, but with the coils wrapped close to each other. This spring is soldered or fixed in a hole in the middle of a bearing plate, the said spring having fixed in its axis a centre piece in which the reel spindle works. An elastic centre is thus formed which yields in the direction of the length of the shuttle, but is incapable of yielding laterally or at right angles to the axis of the shuttle. The bearing plate may be omitted and the flat convolute spring be connected directly to the shuttle. The flanges of the reel of the shuttle are raised from sheet metal in dies, and are secured to the reel spindle by pressure.

A.D. 1874, February 18.—No. 603.

BAILLE, Michel, of Faubourg, St. Honoré, No. 124, at Paris, engineer.—" An improved multiple tool."

This invention relates to a tool consisting of two members, the first of which is so shaped that it can be used by itself as a hammer, a measure, or a screw-driver or for drawing nails: the second is so formed that it alone can be employed as a scraper, rasp, or file, or for opening boxes: and the two members coupled together by passing the shank of the first through a mortice in the second, can be made to act as a pincers, vice, universal spanner, or pipe tongs.

A.D. 1874, February 18.—No. 613.

LONG, Richard, of Liverpool, in the county of Lancaster.—" Improvements in and applicable to heating " flat irons for laundry purposes, and in apparatus employed therefor."

An apparatus constructed according to this invention consists of a sheet of iron stamped, cut, or cast to the shape of the base of the flat iron. On the sides of this sheet of iron are formed two projecting lugs, or provisions so made as to clip the bevelled edge of the base of the flat iron. At the top of the apparatus (which may be termed a hanging holder and guard) is formed a hook, or other provision for hanging the apparatus on the fire bars of the grate. In some instances these hanging holders or guards may be made to hold two or more irons by having suitable lugs or provisions fixed thereon to act as clips or supports to the flat irons. In some instances the apparatus may be formed of a thin plate of cast iron, having lugs or provisions cast thereon to act as clips or supports to the bevelled edges of the base of the flat irons, the plate being hung to the bars of a fire grate by suitable hooks or provisions attached to the sides of the plate.

A.D. 1874, February 19.—No. 629.

LEONI, Sigismund, of 34, Saint Paul Street, New North Road, in the county of Middlesex, manufacturer. —" Improvements in heating and cooking apparatus."

In heating apparatus heated by means of gas or oil, a condenser is employed in order to separate the aqueous vapour from the gaseous in the products of combustion, and facilitate the escape of the noxious gases, the water of condensation passing from the condenser through a syphon, and the noxious gases through a flue of smaller diameter than usual.

In apparatus for cooking by gas, the several processes of roasting, baking, steaming, and water boiling can be carried on simultaneously by the combustion and arrangement of the parts.

A.D. 1874, February 20.—No. 650.

CLEGG, Edward Alford, of Shore Mills, Littleborough, in the county of Lancaster, manufacturer, and HOYLE, Abraham, of the same place, manager.—" Certain improvements in looms for weaving."

Our improvements consist in applying a pair of compressing rollers to act upon the fabric when woven, which rollers are placed in any convenient position between the fell of the fabric and the cloth beam.

A.D. 1874, February 21.—No. 662.

WEST, Daniel Kemp, of Crown Place, Kentish Town, in the county of Middlesex, engineer.—"Improvements in engines to be driven by water and steam, and in pumps."

A number of cylinders arranged with their axes parallel to each other contain pistons which are caused to act successively on the surface of a conical disc working on a corresponding inverted fixed cone, and thereby to impart to the disc a rolling motion, which is communicated through an arm or arms to the crank.

The pistons may be worked by means of an ordinary slide valve driven from the shaft, or a rotary valve or valves worked from the disc.

A.D. 1874, February 21.—No. 664.

HOPKINS, Daniel, of Tipton, in the county of Stafford, provision merchant.—"Improvements in the manufacture of artificial butter."

This invention refers to a method of manufacturing artificial butter from the fat of beef, mutton, or pork, by which method the fat is freed from organic impurities, and the artificial butter so produced possesses the cool smoothness on the palate peculiar to butter and also to a great degree its flavour.

A.D. 1874, February 21.—No. 667.

MUNTZ, Philip Albert, of Keresley, in the county of Warwick, gentleman, and **SHARP, Thomas Budworth**, of the French Walls Works, Smethwick, in the county of Stafford, mechanical engineer.—"Improvements in the process of and apparatus for condensing and collecting the fumes evolved by furnaces used for melting metals and for other metallurgical operations."

According to this invention the zinc or other fumes are conducted into a vertical flue in connection with the chimney stack of the furnace, and from thence to a condensing chamber or vessel. The damper of the chimney stack has a sand valve, and in the vertical flue described is a steam jet and also a perforated ring or rose. Cold water in a thin sheet or in a finely divided state passes by the said ring or rose into the vertical flue, and by the condensation of the steam of the steam jet not only aids in increasing the draught but also condenses and collects a considerable quantity of the fumes or condensible matter drawn from the furnace. The fumes from the vertical flue are conducted or drawn into a closed condensing chamber partly filled with water, the fumes either passing under a perforated diaphragm or under inclined shelves or divisions in a tortuous or zig-zag path. The suspended and condensible matter is wholly or mainly retained by the water, while the gaseous matter escapes by a pipe opening into the upper part of the chamber. The fumes before they pass into the condensing chamber may be conducted through the flue of a steam boiler and thereby partly cooled.

A.D. 1874, February 21.—No. 668.

JONES, Edward Fiddian, of Birmingham, in the county of Warwick, brass founder and lamp manufacturer.—"Improvements in railway, ship, and other lamps."

This invention consists of the following improvements in those parts of railway, ship, and other lamps which provide for the ingress of cold air and the egress of heated air. The cold air is supplied to the lamp by an air chamber or channel in the upper part of the interior of the lamp case. External air enters this chamber through perforations in the case of the lamp, and descending in the said chamber enters the lamp case through the wire gauze bottom of the chamber. The heated air escapes from the lamp through a perforated cap or screen over the opening to the head and in the inner tube of the head. By means of a disc or plate supported under the opening to the head, and forming a double top to the lamp, currents of air entering the lamp by the head, are prevented from passing down the chimney of the lamp.

By these improvements the flame of the lamp is effectually protected from wind or currents of air, and the flickering or unsteadiness of the flame is prevented.

A.D. 1874, May 8.—No. 1625.

BULL, William, of Ewell, in the county of Surrey, civil engineer.—"A new or improved hand dredger for sinking wells in foundations of bridges and for other similar useful purposes."

According to this invention two semicircular or semi-cylindrical metal receivers are used, or two quadrants, forming when united the semicircular or similar construction.

The two sections are united by joints or by a central shaft, and four arms are attached to the corners or angles of the quadrants, the outer ends of the arms being joined by cross bars, on which two pulleys or guides are fixed in bearings. Two lengths of chain pass over the top of the receiver and under the pulleys, their ends being joined by a ring, and a key serves to keep the two sections from closing until contact of the machine occurs with the material to be excavated.

The machine is lowered to the earthy substance, and an up and down motion is applied by means of a rope, so that by this motion and the weight of the receivers the machine penetrates the subsoil, and is ultimately raised full of material. The machine is then released of its load by the mere operation of re-setting it for the next descent.

A.D. 1874, May 28.—No. 1865.

MARSH, Thomas Herbert, of Toronto, in the province of Ontario, Canada, but now residing at Oatlands, in the county of Surrey, merchant.—(*A communication from Israel Kinney, of London, in the province of Ontario, Canada.*)—" Improvements in clamping tools and screw wrenches."

According to this invention the clamping tool consists of two bars inclined to one another, and joined at the narrow end by a curved piece. On one of the said bars a sliding jaw works, the acting face of which is inclined to the base, so that on moving the jaw along the bar, the distance between it and the other bar is increased or diminished, while the parallelism of the face of the sliding jaw to the bar, opposite to it is preserved. After the sliding jaw has been moved on the bar so as to nearly clamp the substances or things, the tool is struck gently so as to advance it, the jaw remaining stationary. The sliding jaw is thereby tightened on the substances or things, and the latter clamped.

Screw wrenches are constructed in the same manner as clamping tools, excepting that the inclined bars are connected at both ends by junction pieces.

A.D. 1874, August 12.—No. 2783.

ROYER DE LA BASTIE, François Barthelemy Alfred, of Boulevard de Strasbourg, No. 123, at Paris, France.—" A new process of tempering flat and shaped glass; and furnaces and machinery to be " employed therefor."

This invention relates to a process of tempering glass so as to render the same less fragile, and to the construction of furnaces and apparatus for this purpose.

The essential features of the invention consist firstly in tempering glass by plunging it when heated to about the point of softening into a liquid bath at a lower temperature. Secondly, in using for this purpose a hermetically enclosed bath of oils, grease, wax, resinous or bituminous substances which boil at temperatures considerably above the boiling point of water. Thirdly, in an arrangement of glass tempering apparatus wherein the oven for heating the glass and the tempering bath are in communication with each other, so that the heated glass can be plunged with the least possible manipulation. Fourth, in arrangements of heating ovens with rocking floors or with inclined floors, whereby the glass is made to pass from the oven to the tempering bath. Fifth, in the construction of muffle ovens communicating with the tempering bath by passages down which the glass descends. Various constructions of apparatus are shewn for carrying out the invention.

A.D. 1874, August 13.—No. 2801.

BROWNE, Alexander, of the firm of Browne and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—(*A communication from Isaac Dickinson Guyer, of New York city, in the county and state of New York, United States of America.*)—" An improved bolt and nut lock, and in " machinery to be employed for the manufacture thereof."

The features of novelty of this invention consist,—

Firstly. In the employment of a slotting tool which operates in connection with a pair of holding dies for forming in a rod of metal a seat or groove for the reception of a nut locking anchor, the said slotting tool being of any desired shape and arranged to operate through a slot in one of the holding dies, so as to form a slotted groove by compression of the metal.

Secondly. In a bolt constructed with a slot and a cavity for the reception of an anchor for keeping the nut in its place on the bolt.

A.D. 1874, August 14.—No. 2810.

HASELTINE, George, of the " International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Richard Norton Allen, of Hudson, New York, United States of America.*)— " Improvements in railway carriage wheels."

The tire of the wheel is provided with an annular flange, which is so arranged in relation to the perimeter of the tire that it shall project from some point between the circumferential edges thereof, forming a recess on each side of the flange. A core is fitted in the flange side of the tire.

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Blair, T. S. (Imray), 308, Regenerative furnaces.
Blair, T. T., 235, Anti-fouling composition for ships.
Blake, C. E., 92, Dentistry.
—— J., 396, Steam generators and safety valves.
Bland, J., 2436 (*App.* 3.) Looms.
Blaxland, G., jun., 401, Raising sunken vessels.
Bleasby, A., & Haigh, W. B., 556, Furnaces or cupolas.
Bliss, S. B. (Clark), 2366 (*App.* 2.) Making soap bubbles.
Boëthius, E. (Gilbee), 354, Cork-cutting machines.
Boll, M., & Wacker, C. (Bonneville), 647 (*App.* 34.) [Ships' fenders.

Bond, J., Threlfall, R. A., & Hamer, W., 30, Polishing
[spinning rollers, &c.
Bonneville, H. A. (*Berthier*), 14, Printing presses.
——— (*Berthier*), 15, Copying presses.
——— (*Lambert*), 110, Coal pit wagons.
——— (*Leeb*), 471, Table tops.
——— (*Joly*), 518, Fire alarms.
——— (*Wacker & Boll*), 647 (*App.* 34.) Ships' fenders.
——— (*De Mestre*), 683 (*App.* 35.) Wiring bottles.
——— (*Devlan*), 767 (*App.* 36.) Packing journal
[boxes.
——— (*Marchand*), 1170 (*App.* 41.) Railway breaks
[and couplings.
——— (*Broux*), 1230 (*App.* 41.) Lubricating spindles.
——— (*Baville*), 1231 (*App.* 41.) Tool-holders.
——— (*Burns, Higgins & Higgins*), 1271 (*App.* 42.)
[Water-closets.
——— (*Martin*), 2536 (*App.* 4.) Spinning fibres.
Bousfield, E. T., & Howard, J., 178, Steam cultivators.
——— 331, Steam-boilers.
——— G. T. (*Manley*), 58, Rotary engines and pumps.
——— (*Smith*), 380, Electrical machines.
——— (*Heaton*), 2194 (*App.* 52.) Buttons.
——— (*De Fresne*), 2388 (*App.* 2.) Propelling ships.
Bowman, H., & Newall, R. S., 165, Muriatic acid gas.
Box, W. W., 566, Gas.
Bradbury, G. F., and Lomax, H., 263, Sewing-machines.
Bradley Window Co. (Gedge), 91, Ventilating window
[sash.
Brakell, C., 313, Weaving and cutting pile fabrics.
Bramall, S., & Groves, F., 83, Railway breaks.
Bramwell, G., 79, Restoring and dyeing hair.
Brannon, P., 1246 (*App.* 41.) Building materials.
——— 1372 (*App.* 43.) Bridge girders.
——— 1472 (*App.* 44.) Decorating slabs, panels, &c.
——— 2128 (*App.* 51.) Building materials.
Brayton, G.B. (Haseltine), 2209 (*App.* 52.) Gas-engines.
Brennan, J., 139, Teaching arithmetic.
Brewer, E. G. (*McLean*), 2629 (*App.* 5.) Clasps.
——— (*Joly*), 433, Incinerating vegetable substances
[from wool, &c.
Broadfoot, J., 239, Pumps.
Brocchus, P. E., Morris, G. W., Robinson, J. S., &
[*Mackenzie, G.N.* (Benson), 64, Metallurgical
[furnaces.
——— *P. E., Rehbein, W. G., & Roberts, H.* (Benson),
[495, Welding copper.
Brook, E., & Wilson, A., 427, Consuming fuel in furnaces.
Brookes, W. H., 84, Pumps.
Brooks, F. W. (Everett), 500, Liquid meters.
Brooks, W., 727 (*App.* 35.) Fringing fabrics.
Broux, D. (Bonneville), 1230 (*App.* 41.) Lubricating
[spindles.
Brown, A., 307, Dredgers.
Brown, D., & Fulton, J. (Haseltine), 1054 (*App.* 39.)
[Sheep shears.
——— *E.* (Lake), 1421 (*App.* 4.) Rotating shaft indicators.
——— *J. R.* (Miller), 98, Treating fatty matters.
Brown, W. Morgan- (*Keniston*), 5, Boot and shoe fastenings.
——— (*Gardner & Pocock*), 450, Boots.
Browne, A. (*Knapp*), 66, Raising sunken vessels.
——— (*Foundries & Forges Co.*), 220, Iron and steel.
——— (*Foundries and Forges Co.*), 422, Alloys of iron.
——— (*Guyer*), 2801 (*App.* 7.) Bolt and nut lock.
——— R. J., 816 (*App.* 6.) Obtaining motive-power.
Buchholz, G. A., 17, Obtaining motive-power.
Buckingham, W., 551, Heating buildings and steam-boilers.
Bucknall, F., 362, Digging roots and cultivating land.
Budenberg, A. (*Schäffer & Budenberg*), 327, Injectors.
Budenberg, C. F., & Schäffer, A. (Budenberg), 327,
[Injectors.
Bull, W., 1625 (*App.* 7.) Hand dredger or excavator.
Bullough, J., 177, Sizing and drying yarn.
Burgess, C. T. & W. J., 183, Reaping and mowing machines.
——— W. J. & C. T., 183, Reaping and mowing machines.
Burley, W., & Howes, W., 303, Carriage lamps.
Burns, J., & Higgins, C. S. & W. B. (Bonneville), 1271
[(*App.* 42.) Water-closets.
Burton, C. C., 338, Wheels for traction engines.
Buss, W., & Maplesden, J., 361, Ploughs.
Butterworth, E., 228, Spinning fibrous substances.

C.

Caffall, R. M., & Thomas, A., 467, Sealing gas mains, &c.
Cain, T., 86, Hollow fire-bars.
Callender, J. A., 462, Railway signals.
Cambon & Co. (Johnson), 18, Preserving fabrics, wood, &c.
Camp, A. van, & Clark, G., 33, Pavements.
Campbell, J., & Somerville, W. C., 538, Mortar mills.
Campion, G., 498, Harrows, &c.
Cannon, T., 330, Glue.
Capon, L. J. B. (Lacaze), 287, Looms.
Casement, D. T. (Clark), 69, Combustion of fuel, &c.
——— (Clark), 70, Regulating pressure of fluids.
——— (Clark), 351, Combustion of fuel.
Cathro, J. J., Girvan, J., & Lecerf, H., 394, Ornamenting
[paper.
Cattanach, D. D. (Lake), 423, Gum, &c.
Chalk, W. H., & Chubb, G. H., 320, Safes and doors.
Chalumet, G. (Mewburn), 156, Textile fabrics.
Chamberlin, W. R. B., 54, Electro-motive-power.
Chandler, S., & Hulett, D., 1287 (*App.* 42.) Gas.
Chapin, E. P. (Condit), 316, Weaving ribbons, &c.
Chapman, G., 38, Sesqui-carbonate of ammonia.
Charles, P., 353, Controlling supply of water.
Chatwin, H., 504, Finger boards of pianofortes, &c.
Cherry, H., 404, Steam pumps.
Chiozza, L. (Clark), 480, Treating maize.
Chippindale, I., 318, Sifting cinders.
Chubb, G. H., & Chalk, W. H., 320, Safes and doors.
Clark, A. M. (*Casement*), 69, Combustion of fuel, &c.
——— (*Casement*), 70, Regulating pressure of fluids.
——— (*Rogers*), 208, Lamp black.
——— (*Sawyer*), 253, Electric telegraphs.
——— (*Morton*), 290, Propelling vessels.
——— (*La Grove*), 292, Mechanical toy.
——— (*Pelouze & Audouin*), 322, Gas-purifying.
——— (*Ligny*), 323, Drying and heating.
——— (*Allin*), 350 Cutting and screwing pipes.
——— (*Casement*), 351, Combustion of fuel.
——— (*Tracy & Lawton*), 363 Sewing-machine cabinets.
——— (*Goodwin*), 364, Cutting button holes.
——— (*Gschwind & Beberdick*), 421, Mouldings.
——— (*McKinley*), 438, Hoeing, &c.
——— (*Chiozza*), 480, Treating maize.
——— (*Robert*), 547, Clocks.
——— (*Davies*), 952 (*App.* 38.) Signal lanterns.
——— (*Cook*), 1019 (*App.* 39.) Preparing grain for flour.
——— (*Doremus*), 1410 (*App.* 43.) Springs.
——— (*Bliss*), 2366 (*App.* 2.) Making soap bubbles.
——— (*Universal Signal Light Co.*), 2390 (*App.* 2.)
[Signal lanterns.
——— (*Miltimore, Phillips & Morris*) 2498 (*App.* 3.)
[Railway carriage axles.
——— (*Atkinson*), 2563 (*App.* 4.) Steam pumps.
——— E. P., 49, Teaching military drill.
——— G., & Van Camp, A., 33, Pavements.
——— J., 204, Waterproof garments.
——— J. L., & Standfield, J., 111, Docks and pontoons.
——— J. L., & Standfield, J., 202, Docks and pontoons.
——— J. L., & Hill, E. J., 564, Railway signalling.
——— W. (*Lo Forte & Quintaralle*) 593 (*App.* 34.) Ships.

Clarke, H., 818 (*App.* 36.) Combination locks.
Clayton, R. H., Harrison, J., & Loynd, W., 537, Air [Pumps.
Clegg, E. A., & Hoyle, A., 650 (*App.* 7.) Looms.
——— J., & Taylor, R., 555, Mules and twiners.
Cliff, E., & Vose, R. (Lake), 2712 (*App.* 6.) Elliptic [springs.
Cluderay, T., 2372 (*App.* 2.) Separating stony substances [from foreign beans and wheat.
Coats, P., jun., 469, Re-winding yarn or thread.
Cockerham, H., 309, Stripe motion of looms.
Cockings, J. S. (*Reynolds*), 154, Snaps or connectors.
Cohné, S., 37, Composition for bearings.
Cohrs, J. H., 142, Railway couplings.
Cole, F., 181, Crushing and reducing baryta, cocoa, &c.
Collicott, J. (Adams), 333, Kaleidoscopes.
Collicott, J., 2476 (*App.* 3.) Tube scrapers.
Collingridge, A. (*Folliet & Gally*), 374, Axle boxes.
Condit, F. (*Chapin*), 316, Weaving ribbons, &c.
Conklin, G. (Lippincott), 237, Condensed milk.
Cook, O. F. (Clark), 1019 (*App.* 39.) Preparing grain [for flour.
Cooper, C., 417, Working railway points.
Cope, E., & Maxwell, J. R. (Benson), 1086 (*App.* 40.) [Steam-engines.
Coppin, W., 402, Construction of ships.
Copping, R., & Walworth, J., 2067 (*App.* 51.) Preparing [wheat for grinding.
Corbett, A. F., 568, Artificial fuel.
Cordes, B., Suarés, S. L., & Fonsèque, D. F. (Espir), [510, Cutting down trees.
Corkran, J. F. (*Archbald*), 87, Manures.
Cornely, E. (Gedge), 107, Embroidering machines.
Corpe, C. W., 141, Construction of concrete buildings.
Cotter, W., 1, Combined folding bedstead and air bed.
Cottingham, G. W. (Lake), 1730 (*App.* 46.) Ironing [machines.
Cox, S. G., 520, Pills.
——— W., 115, Sacks or bags.
Cramp, C. C., 407, Tramway apparatus.
——— C. C., 491, Tramways.
Craps, J., & Derihon, J. (*Reintjens*), 529, Non-conducting [mastic.
Crombie, G., & Somerville, G., 365, Cutting paper, &c.
Crosland, J. S., 151, Economizing fuel, &c. in furnaces.
Crosskill, T. A., & Marshall, W., 118, Wringing and [mangling.
Crowell, J. H. (Haseltine), 2291 (*App.* 1.) Weavers' [harness.
Cruickshank, A. B., 89, Cleats for sailing boats.
Cunningham, D., & Douglas, A., 336, Scotch bonnets.
Curtis, F. (*Williams & Page*), 24, Lamps.
——— W. J., 502, Railway points.

D.

Daddow, S. H., 1558 (*App.* 45.) Fuses for mining and [blasting.
Daimler, G. W. (Abel), 414, Gas motor engines.
——— (Abel), 605 (*App.* 50.) Gas motor engines.
Dalzell, J. B., 560, Signalling on railways.
Dàmkoehler, J. A. H. (Tongue), 505, Preserving meat.
Danet, G. A., & Feuillant, X. C. E., 1007 (*App.* 39.) [Preserving food.
Dann, J. T. (*Gervais*), 530, Cooking utensils.
David, A. (Ray), 100, Producing optical illusions.
Davies, D., 88, Steam-boilers.
——— 104, Governors of steam-engines.
——— H. D., 400, Roads and roadways.
Davies, I., 413, Separating "black plate."
Davies, T. A. (Clark), 952 (*App.* 38.) Signal lanterns.
Daville, R. S. (*Webster & Webster*), 2647 (*App.* 5.) [Sewing machines.
Davis, J. W., & Strauss, L., 2560 (*App.* 4.), Fastening [pockets.
Dawson, T. G., & J., 1845 (*App.* 48.) Printing.
——— J., & T. G., 1845 (*App.* 48.) Printing.
Deacon, H., 163, Treating substances employed in effect- [ing chemical decomposition of gases.
Dean, S., Smith, W. H., & Merrell, H. (Haseltine), 2001 [(*App.* 50.) Millstones.
Dearman, R., 397, Saving fuel and consuming smoke.
De Fever, C., 209, Sowing and planting.
De Fresne, E. L. J. E. (Bousfield), 2388 (*App.* 2.) Pro- [pelling ships.
Deiss, A. A., 147, Extracting quinine from bark.
De la Bastie, F. B. A. R., 2783 (*App.* 7.) Tempering glass.
Delalot, S. L., 302, White metal.
De la Rue, W. W., & Shaw, W. T., 311, Date indicators.
Delavigne, N. A., 56, Corkscrews.
Deléon, J., 525, Building materials, &c.
De Louvagny, Comte de Beaurepaire, 591 (*App.* 7.) [Alcohol.
De Mestre, A. (Bonneville), 683 (*App.* 35.) Wiring [bottles.
Dennis, T. H. P., 431, Water waste preventors.
Deny, L., 16, Perforating metal plates.
Derihon, J., & Craps, J. (*Reintjens*), 529, Non-conducting [mastic.
Derry, J. D., 135, Lamp and candle holders.
Dethiou, L. H., 542, Buckles.
Devlan, P. S. (Bonneville), 767 (*App.* 36.) Packing [journal boxes.
De Vogt, H. C., 81, Navigating the air.
De Weerd, R. van, 245, Producing motive power.
Dewynter, C. (*Lenoir*), 430, Purifying gas.
De Zuccato, E., 1078 (*App.* 40.) Producing fac-similes [of writings, &c.
Dobson, James & John (Barlow), 11, Carding wool.
——— *John & James* (Barlow), 11, Carding wool.
Donisthorpe, A. R. & G. E., White, G., & Toon, J., 171, [Woollen yarns.
——— G. E. & A. R., White, G., & Toon, J., 171, [Making woollen yarns.
Doremus, W. T. (Clark), 1410 (*App.* 43.) Springs.
Douglas, A., & Cunningham, D., 336, Scotch bonnets.
Drechsler, F. J., 133, Winnowing machines.
Dryden, J. A., & Tandy, G. G., 347, Lamps.
Dubois, E. A. (Vaughan), 246, Air-gas.
Duckett, G., & Mercer, T., 4, Size.
Dudgeon, A., 20, Utilizing heat of furnaces.
——— 22, Peat-fuel.
Duncan, J. T. (*Hunt*), 546, Precipitating metallic copper.
Dunn, W. W., 503, Drilling rock.
Dunning, G., & George, C. B. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.
Dutton, S. T., 230, Railway points.
Duval, J. (Jensen), 13, Fire-arms.
Dyer, E., 328, Fire escapes.
Dyk, H. van, 199, Dressing and travelling bags.
Dyson, G. W., 122, Rolling metals, &c.

E.

Easton, W., & Tattersall, F., 248, Moulding bricks, &c.
Eastwood, D., 186, Looms for weaving.
Edwards, J., 384, Valves.
Edwards, S., & Erichsen, E. J. (Jensen), 138, Vats [gas-holders, &c.

Egerton, P., 617 (*App.* 6.) Mounting spindles.
Elder, H., 481, Railway breaks.
Ellis, J. E., & Redgate, E., 172, Treating hides and skins.
Emsley, S., & Peel, J., 47, Looms.
Emslie, J. T., 40, Registering omnibus passengers.
Enoult, A., fils, & Varinet, J. (Abel), 184, Dressing fabrics.
Erichsen E. J., & Edwards, S. (Jensen), 138, Vats, &c.
Espir, C. (*Suarès, Fonsèque & Cordes*), 510, Cutting down trees.
Essen, W. S. von, 492, Cleaning steam-boiler flues.
Everett, G. A. (*Brooks*), 500, Liquid meters.
Eyre, G., 164, Convertible school desks and seats.
Eyth, M., & Greig, D., 527, Towing machinery.

F.

Fallows, J. T., Marlow, J. B., & Roebuck, J., 274, Railway points.
Fanning, J., & Nugent, E., 191, Screws.
Farquhar, J. F. C., 112, Gas burners.
Ferguson, F. T. (Benson), 426, Pipe tongs and cutters.
Feuillant, X. C. E., & Danet, G. A., 1007 (*App.* 39.) Preserving food.
Fever, C. de, 209, Sowing and planting.
Finger, L., 298, Electro-magnetic annunciators.
—— 1779 (*App.* 47.) Electro-magnetic annunciators.
Fitzgerald, D. G., & Molloy, B. C., 266, White lead.
Fleming, G. S., 120, Caps for candles when burning.
Floyd, J. R. (Lake), 679 (*App.* 35.) Gas-retort joints.
Folk, J. E., & Wilson, C. F. (Newton), 458, Bolsters and bearings for spindles.
Folliet, L., & Gally, M. (Collingridge), 374, Axle boxes.
Fonsèque, D. F., Cordes, B., & Suarès, S. L. (Espir), 510, Cutting down trees.
Forbes, G. H., 26, Gas making.
—— 28, Fuel.
—— 34, Cements, plaster and artificial fuel.
—— 231, Purifying gas; artificial fuel.
—— 232, Purifying gas.
Ford, A., 269, Cleansing cotton waste.
—— S., 486, Actuating prime movers.
Forges & Foundries Co. (Browne), 220, Iron and steel.
—— (Browne), 422, Alloys of iron.
Forte, R. Lo, & Quintaralle, R. (Clark), 593 (*App.* 34.) Ships.
Foster, J., & Whitaker, W., 143, Cleaning reed dents.
Fottrell, J., 77, Artificial stone pipes and tubes.
Foulis, W., 153, Charging retorts.
Foundries & Forges Co. (Browne), 220, Iron and steel.
—— (Browne), 422, Alloys of iron.
Fowlie, J. F., 2, Harness.
Fox, F. W., 82, Combing fibres.
—— T., 257, Spring mattresses.
Frankenstein, P., 484, Waterproof overcoats.
Fresne, E. L. J. E. de (Bousfield), 2388 (*App.* 2.) Propelling ships.
Friedmann, A., 373, Heating boilers of steam ships.
Fulton, J., & Brown, D. (Haseltine), 1054 (*App.* 39.) Sheep shears.

G.

Gaillard, L. J. P. E. (Touaillon), 519, Stopping teeth.
Gally, M., & Folliet, L. (Collingridge), 374, Axle boxes.
Gardner, C. F., & Pocock, E. (Morgan-Brown), 450, Boots.
Garton, W., 508, Treating grains or spent malt.
Gaylord, E. (Henderson), 2110 (*App.* 51.) Fire-arms.
Gebauer, F., 321, Hydraulic mangles.
Gedge, W. E. (*Bradley Window Co.*), 91, Ventilating window sash.
—— (*Cornely*), 107, Embroidering machines.
—— (*Renard, fils.*), 130, Steam generators.
—— (*Liotard, jun.*), 242, Gas burners.
George, C. B., & Dunning, G. (Haseltine), 2475 (*App.* 3.) Horse-shoes.
Gerhard, F. W., 367, Purifying iron ores.
Gervais, A. (Dann) 530, Cooking utensils.
Gibbs, W. A., 50, Drying apparatus.
Gibson, H. W., & Sons (Jensen), 273, Wood working machinery.
Gibson, W., 435, Furniture castors.
Gilbee, W. A. (*Boëthius*), 354, Cork-cutting machinery.
Gilbert, W., & Leonardt, F., 434, Pen and other boxes.
Gilles, F. G. (Gottheil), 25, Gas engines.
Girvan, J., Cathro, J. J., & *Lecerf, H.*, 394, Ornamenting paper.
Glover, H., 346, Sulphuric acid.
Goater, J., 552, Fireproof safes.
Gold, R. S., 524, Hats.
Goodwin, C. R. (Clark), 364, Cutting button holes.
Gosselin, L. F., 514, Swimming jackets.
Gottheil, R. (*Oesten*), 6, Measuring heat of fluids in pipes.
—— (*Mehl*), 21, Treating wool.
—— (*Gilles*), 25, Gas engines.
—— (*Lemmens*), 36, Dyeing warps.
Goulding, W., 405, Furniture, &c.
Gouverneur, J., & Hamilton, J. B., 443, Musical instruments.
Gower, G. G. W. Sutherland-Leveson- (Duke of Sutherland), 319, Steam cultivators.
Gray, E. (Johnson), 2646 (*App.* 5.) Transmitting musical tones.
Green, H. T., & Price, C. W., 29, Railway breaks.
Greener, H., 268, Glass letters and figures.
Greenwood, J., & Pooley, H., jun., 126, Weighing machines.
Gregory, H. S., 571, Seed and manure drills.
Greig, D., & Eyth, M., 527, Towing machinery.
Griffin, J. T. (*Austin*), 219, Wrenches.
Griffin, R. A. (Lake), 212, Peat-fuel.
Griffin, T., 271, Coupling for driving belts.
Griffith, G., 602 (*App.* 7.) Sewing-machine shuttles.
Griscom, S. E., & Larer, D. (Haseltine), 1129 (*App.* 40.) Millstones.
Grove, W. A. P. la (Clark), 292, Mechanical toy.
Groves, F., & Bramall, S., 83, Railway breaks.
—— T. B., 476, Cigarettes and cigars.
Grubinski, F., 281, Mowing machines.
Gruby, J., 312, Umbrellas and parasols.
Gschwind, J., & Beberdick, C. (Clark), 421, Mouldings.
Gurr, J., & Williams, D., 103, Anchors.
Gutteridge, F., & Siddall, J., 243, Oil lamps.
Guyer, I. D. (Browne), 2801 (*App.* 7.) Bolt and nut lock.

H.

Hache, E. H. (*Lévy*), 301, Gas pressure indicator.
Hahn, F., 360, Compressed fuel.
Haigh, W. B., & Bleasby, A., 556, Furnaces or cupolas.
Hall, J., 468, Treating spent tan, spent hops, &c.
Hamer, W., Bond, J., & Threlfall, R. A., 30, Polishing spinning rollers, &c.
Hamilton, J. B., 119, Musical instruments.
—— & Gouverneur, J., 443, Musical instruments.
Hannam, W., & Smith, A., 562, Preparing peat.

Harfield, W. H., 310, Capstans and windlasses.
Hargreaves, J., & Robinson, T., 448, Sulphates of soda
[and potassa.
Harling, G., & Whiteley, W., 244, Looms for weaving.
Harlow, B., 541, Earthenware printers' stoves.
Harmignies, A. (Johnson), 658 (*App.* 5.) Steam-engines.
Harper, J., 951 (*App.* 38.) Steam and air-engines.
Harrington, J., 44, Locks or fastenings.
——— 71, Treating skins or hides.
Harris, D. (Lake), 539, Stretching boots and shoes.
Harris, J., & Judson, J., 304, Sewing machines.
Harrison, James, 383, Condensing, refrigerating, &c.
——— John, Loynd, W., & Clayton, R. H., 537, Air
[pumps.
Harrison, T. W., & *Richardson, A. P.* (Haseltine), 1109
[(*App.* 40.) Looms.
Harrop, J. J., 485, Tin and lead piping, &c.
Hart, W. (Johnson), 358, Lowering and hoisting apparatus.
Hartley, J., & Rawsthorne, S., 62, Sizing yarns.
——— O. H., & Smith, J. H., 188, Self-acting mules.
Hartmann, G. H. J. & W., 229, Locking and unlocking
[railway carriage doors.
——— W. & G. H. J., 229, Locking and unlocking
[railway carriage doors.
Harvey, J. F., 258, Umbrellas, &c.
Haseltine, G. (*Jones & Pauly*), 35, Steam-engines.
——— (*Thurston*) 96, Testing wood, iron, &c.
——— (*Beckwith*), 474, Sewing-machines.
——— (*McGhee & Risher*), 807 (*App.* 36.) Steam-
[engines.
——— (*Hopper*), 815 (*App.* 36.) Dry gas-meters.
——— (*Meaker*), 937 (*App.* 38.) Hoistway doors.
——— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep
[shears.
——— (*Harrison & Richardson*), 1109 (*App.* 40.)
[Looms.
——— (*Larer & Griscom*), 1129 (*App.* 40.) Millstones.
——— (*Smith*), 1219 (*App.* 41.) "Buttereine."
——— (*Read*), 1223 (*App.* 41.) Water-meters.
——— (*Isbell*), 1632 (*App.* 45.) Buttons.
——— (*Higley*), 1936 (*App.* 49.) Railway trucks and
[axle-boxes.
——— (*Dean, Smith, & Merrell*), 2001 (*App.* 50.)
[Millstones.
——— (*Thompson*), 2108 (*App.* 51.) Sewing machines.
——— (*Brayton*), 2209 (*App.* 52.) Gas-engines.
——— (*Walsh*), 2288 (*App.* 1.) Syringing bottles.
——— (*Baker*), 2289 (*App.* 1.) Scoop and sifter.
——— (*Crowell*), 2291 (*App.* 1.) Weavers' harness.
——— (*Bate*), 2352 (*App.* 2.) Refrigerating apparatus.
——— (*Dunning & George*), 2475 (*App.* 3.) Horse-
[shoes.
——— (*Rabbeth*), 2497 (*App.* 3.) Spinning machine
[spindles and bolsters.
——— (*Roach*), 2640 (*App.* 5.) Faucets.
——— (*Thurston*), 2741 (*App.* 6.) Forging, drilling
[and riveting.
——— (*Allen*), 2810 (*App.* 7.) Railway wheels.
Hazeldine, F., 565, Valves or taps.
Hearson, C. E., 167, Argand burners for gas and oils.
Heaton, C., 189, Emery and other grinding machines.
——— C., 689 (*App.* 5.) Emery wheels.
Heaton, D. (Bousfield), 2194 (*App.* 52.) Buttons.
Heaven, A., 446, Ornamenting woven fabrics.
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Hepworth, S. S., & Paulding, G., 1798 (*App.* 47.) Cen-
[trifugal machines.
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Heyworth, E., & Smalley, W., 375, Steam-boilers.
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Mackenzie, G. N., Brocchus, P. E., Morris, G. W., &
[*Robinson, J. S.* (Benson), 64, Metal furnaces.
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——— W., & Crosskill, T. A., 118, Wringing and
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——— (*Keniston*), 5, Boot and shoe fastenings.
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[*Brocchus, P. E.* (Benson), 64, Metal furnaces.
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[fumes in furnaces.
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Pichard, L. M., 416, Carding engines.
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Pochet, H., 553, Combined bottle stopper and drinking
[vessel.
Pocock, E., & Gardner, C. F. (Morgan-Brown), 450,
[Boots.
Pollok, A. (Johnson), 247, Shoe tips.
Poole, J. T. (Lake), 473, Life buoys.
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[machine spindles and bolsters.
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Reed, J., 355, Boilers and furnaces.
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[495, Welding copper.
Reintjens, L. J. (Craps & Derihon), 529, Non-conducting
[mastic.
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[495, Welding copper.
Robertson, J., 116, Indicating, &c. tram-car passengers.
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[*Morris, G. W.* (Benson), 64, Metal furnaces.
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[and potassa.
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[way points.
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3. Appendix to Chronological and Descriptive Index, containing the Abridgments open to public inspection before the expiration of the term of six months, and also the Abridgments of Complete Specifications received from August 8 to August 14, 1874.
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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 15 to February 21, 1874.

A.D. 1874, February 16.—No. 575.

RMAN, Arthur Rolph, and DE FRECE, Maurice, of Liverpool, in the county of Lancaster.—
mprovements in portable ether and perfume sprayers."

he object here is to provide portable apparatus whereby large quantities of ether or perfume can be ayed or distributed either by an intermittent or continuous supply of air.

or intermittent spraying an elastic pulsator is used to induce a supply of ether or perfume through any inary or suitable arrangement of nozzles.

or continuous spraying an air or gas reservoir is placed in the pipe between the pulsator and the nozzles.

A.D. 1874, February 16.—No. 576.

TKEN, Henry, of Falkirk, in the county of Stirling, North Britain, coal master.—" Improvements in last furnaces and cupolas, and in recovering or collecting the products thereof."

he features of novelty which constitute this invention are :—

irst. The construction of blast furnaces and cupolas with an enlarged chamber or flue, or a series of mbers or flues, at the top for holding the materials before being charged into the smelting chamber of blast furnace or cupola; and the heating of the materials in the said chamber or flues by the combustion he blast furnace, gases ignited by air forced or drawn thereinto; and the enlarging the top of the furnace upola with the like object.

econd. Providing blast furnaces with condensers, scrubbers, filters, or washers for collecting the condenle portions of the gases, and for purifying the non-condensible portions, and chambers for the collecting the products that come from the top of blast furnaces or cupolas.

Third. The construction of blast furnaces for smelting, melting, or puddling operations, with chambers holding the fuel out of contact with the metal in the smelting, melting, or puddling chambers, the gas m the fuel being burnt with air forced or drawn in at numerous points.

A.D. 1874, February 16.—No. 577.

ORNTON, Richard, of South Shields, in the county of Durham, ale and porter merchant.—" Improvements in the construction of machinery for cutting corks."

knife or cutter is mounted on a table capable of traversing longitudinally upon two grooved bars or mounted on a suitable frame, one side of which frame is capable of being raised or depressed. The e of cork to be cut is held between two clamps, one of which is attached to a rod capable of being ted, the other sliding so as to admit of corks of different sizes. These clamps are mounted in suitable rings on the moveable side of the frame. In order to cut the cork, the table with the knife is moved ard so as to bring the latter to bear upon the cork, and by so doing it causes a twisted or spirally grooved mounted on the frame between the rails to revolve by means of a **V** piece attached to the table. The ted bar has a wheel fixed at one end thereof, and which wheel is connected by a band or other suitable ns to another wheel carried by the rod attached to the first mentioned clamp for holding the cork, and giving the latter a rotating motion. The sliding clamp is actuated by means of a lever which is kept osition by a spring. This lever is drawn back by a catch on the table when the cork has been cut and table moved backwards. The moveable side of the frame is elevated by means of a lever when it is red to cut a smaller cork than usual. In order to produce tapered corks, the rails are raised by means screw, so as to place the table, carrying the knife, in a slanting position. For the purpose of keeping knife wet with oil, a small wheel, covered with leather or other absorbent material, and saturated with is fixed on the frame underneath the knife, so that as the latter moves forward, it comes in contact rewith.

A.D. 1874, February 16.—No. 578.

HOLDEN, Edward, of the firm of Isaac Holden and Sons, of Bradford, in the county of York.—" Improvements in preparing wool and other similar fibres for the combing process."

The object of the invention is to separate the longer from the shorter staple of the fibre in the processes of preparing before such fibre is finally combed, so that in such final combing, the longer and the shorter fibres may be separately operated upon.

For this purpose the fibre for the final combing is prepared by the use of comb teeth of any suitable kind, on to which it is fed, and from which it is drawn by two or more sets of drawing off rollers applied at various distances from the carrying or holding combs.

The different distances of the respective drawing off rollers will be varied to the length of staple of fibre for the time under operation, so that the longer fibre only may be drawn off by one set of drawing off rollers, and the shorter fibre only by another or other sets.

In drawing off, the longest staple is generally accumulated on an endless apron before removing it for the final combing, as described in the Specification of Letters Patent dated the 31st of March 1873, No. 1184.

The shorter fibre may be accumulated in the same way, or treated by carding and gilling before final combing.

The improvements also relate to preparing the fibre by straightening it before combing it, by feeding it into gill comb teeth which conduct it to between nipping surfaces, and these then conduct it to porcupine or such like teeth applied at an angle to the axis of a roller, and these porcupine teeth, aided by an endless apron, conduct the fibre to other gill combs to be further straightened, or in place of the porcupine teeth the nippers may conduct the fibre direct to the second set of gill combs.

A.D. 1874, February 16.—No. 579.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Oscar G. Cosby, of Richmond, in the county of Henrico, and state of Virginia, United States of America.*)—" Improvements in invalid bedsteads."

This invention consists of an improved invalid bedstead, in which a canvas sheet made in sections is stretched on one side of the bed on rollers, and on the other on a stationary bar for supporting the patient, while a mattress box or frame is lowered away from underneath for cooling the patient in warm weather, or for other purposes. Joints in the rollers and bar are used so that the foot portion may be dropped, and the head raised up. A foot board or rest for the feet is arranged to be moved along the bedstead. A piece of canvas is arranged under the upper section of the mattress attached to the upper canvas frame for retaining the upper mattress section with the canvas when necessary.

A.D. 1874, February 16.—No. 580.

NAPIER, John David, and **NAPIER, Robert David**, of Glasgow, in the county of Lanark, North Britain, engineers.—" Improvements in winches and other hoisting or hauling machines."

In the improved winches or cranes the third-motion shaft is turned in the same direction whether the single-purchase or the double-purchase is in gear; and this is attained by gearing the third-motion shaft to the second-motion shaft for both purchases. The wheels on the third-motion shaft are fitted thereon with friction clutches of the differential kind described in No. 299 of 1867. In traveller cranes two differential friction clutches are fitted on the driving shaft. One of these clutches is arranged so that when in gear the rotation of the driving shaft brings the tightening action into play; but the other is arranged reversely, so that the rotation of the driving shaft tends to slacken it.

A.D. 1874, February 16.—No. 581.

HARVEY, John, naval architect and shipbuilder, and **PRYER, George**, naval draughtsman, both of Wivenhoe, in the county of Essex.—" An improved system or method and means of applying, adapting, " and setting sails for the better propulsion of vessels."

This invention, which relates to an improved system or method and means of applying, adapting and setting sails for the better propulsion of vessels, consists principally in employing a newly-shaped sail (which we term a " compass gaffsail " or " double mainsail ") which can be applied to all vessels, and especially to yachts or to other vessels which are required to be propelled at great speed. The invention also comprises the improved system, method, or means of applying, adapting, and using the said sail, the objects of the invention being to allow the use of a greater area of canvas or other material than it is safe to apply, set, and work on the systems hitherto in use, which will be applied, adapted, and worked with much greater safety, and to provide a means in case of damage to or loss of other sails of immediately replacing them.

A.D. 1874, February 16.—No. 582.

DIX, Alexander Mills, of Shelton, Stoke-on-Trent, in the county of Stafford.—" Improved methods " of effecting locomotion, by which vehicles can be moved on common roads, tram roads, and railroads."

This consists in fitting a pair of small wheels within inner bands of a pair of larger wheels (travellers) so that the former rise in the circumference of the latter and give a preponderance of weight in advance of the axis for moving a vehicle ahead.

A.D. 1874, February 16.—No. 583.

NEEDHAM, William, of Vauxhall, in the county of Surrey, engineer.—" An improved method of " signalling upon railways."

This invention relates to a method of signalling from a train in case of accident thereto, and consists in the use of detonating signals propelled by rockets along the rail to such a distance that upon the explosion of a signal, warning the driver of an advancing train that the line is blocked, he may pull up before reaching the spot from whence the signal was started.

A.D. 1874, February 16.—No. 584.

SALOMONS, Sir David Lionel, Baronet, of Broom Hill, Tunbridge Wells, in the county of Kent.— " Certain improvements in mechanism or apparatus for indicating the speed of revolving shafts."

The novelty of the invention consists in connecting by means of levers and rods or other equivalent the indicating finger or hand of a numbered dial with the moving lever of a centrifugal governor.

Any shaft in a factory or other works being connected to this governor will, through the arrangement of mechanism connecting the same with the indicating finger, tell-off or indicate the speed or number of revolutions such shaft is making.

A.D. 1874, February 17.—No. 585.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Stuart Perry, of Newport, New York, United States of America.*)—" Im- " provements in rotary hay-tedding machines."

In the said machine the supporting and driving wheels turn independently of each other on a continuous axle tree. A rotating reel is hung upon the main frame in rear of the axle-tree carrying tine bearing shafts having rigid arms, which connect them with a cam-way fastened upon the said main shaft frame. The cam-way has that part of its track which controls the tines while acting on the grass in the form of a true circle, concentric with the axis of the reel, for preventing either acceleration or retardation of the tines; and the other part is formed to cause the tines to dip backward, after lifting, and be restored again before entering the grass.

I employ wrought iron tubular tine shafts; the tines are coiled around each of said tubular shafts and fastened thereto by bolts; the end tines of the series on the tine shafts have an outward bend to bring them near the ground wheels; the tongue-thill and slat frame are made and attached to the axle tree with bent irons. The crank-arms are made with a " set back " for the purpose of giving a longer bearing for the cam-way rollers. In combination with the main frame hinged to the axle-tree I use a branched lever which spans the axle-tree and serves as a brace and lever.

A.D. 1874, February 17.—No. 586.

BRADLEY, Herbert, of Bennett Park, Blackheath, in the county of Kent, gentleman.—" New or im- " proved tell-tale money box."

Money box having one or more compartments, with glass or transparent cover or part to permit inspection, and with moving bottom or part for passing money from compartments into store chamber after the money has been inspected, a counter being worked by or simultaneously with each moving bottom or part.

A.D. 1874, February 17.—No. 587.

WILSON, George Ashley, of Liverpool, in the county of Lancaster, engineer.—" Improvements in and connected with rotary web printing machines."

This consists—

First. In placing both the printing cylinders above the impression cylinders.

Second. In casting stereos in segments or rings and securing them through discs to a shaft to form a printing cylinder, spaces being left between each disc to allow for securing.

Third. In arranging two printing cylinders constructed in accordance with the above second head, so that the blanks left by the spaces between the stereo discs in one cylinder are printed by the stereo discs in the other.

Fourth. In constructing two cylinders of twice the circumference of the paper to be printed, placing type half round and delivering a paper alternately to each. Each paper printed on one side by one cylinder is carried by tapes to be perfected by the other cylinder; the travel is so adjusted that each cylinder is always printing either a first or second side.

Fifth. In wrapping several cut sheets round a drum, and when the desired number has been wrapped round delivering them automatically.

Sixth. In giving a longer travel to each alternate folded sheet, so that it meets the sheet immediately following at the final folding mechanism.

Seventh. In causing each paper previous to folding to partly enter into a rotating drum, from which it is withdrawn by the folding cylinders.

Eighth. Laying papers in combination with the above fifth, sixth, and seventh heads, by (a) a rocking frame, (b) a hammer, (c) a double fly.

Ninth. In cutting sheets of paper from the web in various lengths by cutting rollers geared eccentrically.

Tenth. In causing impressions as they issue from the cylinders to divide into two or more streams between tapes, each stream being led to folding, collecting, or laying mechanism.

Eleventh. In causing the impressions to pass around rollers in lengths of two or more, and in folding a number of the impressions together and afterwards laying them in files.

A.D. 1874, February 17.—No. 588.

MORTON, David, of Oldham, in the county of Lancaster.—" Improvements in the construction of the furnaces of steam boilers for the purpose of consuming smoke and economizing fuel."

The principal feature of novelty in this invention is that there is always a down draught through the fire, so that all the smoke and gases from the fuel are compelled to pass through the clear red fire and thus become consumed, whereby a great economy in the amount of fuel required for producing a given amount of steam is effected, and other benefits arising from a more perfect combustion are attained.

A.D. 1874, February 17.—No. 589.

HENRY, William, of No. 28, Lisle Street, Leicester Square, Middlesex, commission agent.—" Improvements in lighting and heating with carburetted hydrogen gas."

This invention consists in the production of hydrogen by the decomposition of metals and water, and carburetting the same.

A.D. 1874, February 17.—No. 590.

ELLISON, George, of Birkenshaw, in the parish of Birstal, in the county of York, colliery owner, and **DARGUE, Walter**, of the same place, engineer.—" Improved means and apparatus for communicating between passengers, guard, and driver in railway trains; also in the means of working the brakes for retarding or stopping such trains."

The first part of this invention consists of a tube similar to an ordinary speaking tube, which extends the entire length of the train (couplings are provided for joining the tube when required to attach or remove the carriage). Branch tubes are attached to the main tube, one for each compartment, and are provided with a mouthpiece contained within a box or case suitably placed and fixed on the partition of the carriage. Also passing through this box, and extending through the sides of the carriage, is a spindle or rod carrying a signal plate, which, when not in use, will remain in a horizontal position, and this position is maintained by a finger or lever fixed on the rod or spindle within the box, and resting against the outer side thereof which outer side is of glass or parchment. Communication with the guard or driver is effected by the passenger breaking the glass or parchment side of the box, thus removing the support of the finger on the signal rod. He then blows into the tube, thus calling the attention of the guard or driver.

The second part of the invention consists, firstly, in the arrangement, in connection with the brake of each carriage, of a cylinder and piston rod connected with the brake blocks; and steam is supplied to the cylinders by means of a tube passing from the boiler of the engine thereto. An ordinary screw and hand wheel is also applied.

Secondly, in the construction of a brake actuated by hand wheel, whereby the brake blocks are lowered and pressed upon the rails.

A.D. 1874, February 17.—No. 591.

BEAUREPAIRE DE LOUVAGNY, Ludovic Reine Raoul, Comte de, of Boulevard de Strasbourg, 23, at Paris.—" Improvements in purifying alcohol, and in the apparatus employed therein."

This consists chiefly in purifying alcohol, while being distilled, of its etherous impurities by making use of the fact that ether volatilizes at a lower temperature than alcohol. Air is pumped into a boiler containing the alcohol to be purified, raised to such a heat that the ether is volatile while the alcohol remains fixed, and the air bubbling through the liquid carries off the ether.

A.D. 1874, February 17.—No. 592.

SMITH, George Henry, of Finsbury Place, in the county of Middlesex.—(*A communication from Charles H. Perkins and James L. Stowe, both of the city and county of Providence, and state of Rhode Island, United States of America.*)—" Improvements in apparatus for clearing snow and other matters from tramways and " railways."

This invention consists in mounting a plough in advance of the wheels of the vehicle, so that it will adapt itself in respect to position and elevation from the track to the loaded state of the car. It is so arranged, that in the event of meeting an immoveable obstruction, it will be swung rearward until it can pass over it, and then return to its normal position.

A.D. 1874, February 17.—No. 593.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Remigio Lo Forte, of New York, and Robert Quintaralle, of Brooklyn, in the county of Kings, both in the state of New York, United States of America.*)—" Improvements in apparatus for preventing the shifting " of grain or other loose cargoes in ships' holds and in auxiliary rudders for vessels."

This invention relates 1st, to means for preventing the injurious shifting or rolling of grain or seed, or even liquid cargoes in ships' holds; and consists in the employment for this purpose of a series of blades or planks, hinged to the underside of the deck and projecting downward into the cargo.

2ndly. To an improved auxiliary rudder for use when the rudder has been swept away, constructed with swivel blocks at its front edges and attached on both sides the vessel by a system of chains and pulleys.

A.D. 1874, February 17.—No. 594.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Joseph Hirsch, of Paris, in the Republic of France, engineer.*)—" Improvements in the production and in the application of heated air, and in the machinery or apparatus employed therein."

This invention has for its object the utilization of the dynamic and calorific properties of heated air, and consists essentially in effecting the graduated combustion of liquid or gaseous fuel in a receptacle composed of refractory material, heated to a red heat, and containing air, the temperature of which it is required to raise by the ignition of the liquid or gaseous fuel injected therein, and in causing the heated air thus produced to pass through a heat regenerator, composed of small elements of a refractory material, presenting under the form of small spaces a large contact surface and a considerable total section for the passage of the fluid.

The invention is applicable to motive power engines, to the generation and accumulation of pressure, and to the production of hot blast.

A.D. 1874, February 17.—No. 595.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Hermann Kolbe, of Leipzig, in the Kingdom of Saxony, professor.*)—" Improvements in the " production of salicylic acid, and of the isomeric and homologous acids."

The essential features of this invention consist in the production of salicylic acid, and of other acids of the aromatic series by the action of carbonic acid gas on carbolic acid, cressolic acids, or a mixture of them, in presence of alkalies or alkaline earths or a mixture of them.

A.D. 1874, February 17.—No. 596.

WOLLASTON, Charlton James, of 8, Park Place, Marylebone, in the county of Middlesex.—" Improvements in railway recording apparatus."

This Provisional Specification describes recording on a uniformly travelling strip of paper the times of sending the electric signals, and of moving the signal and switch levers.

A.D. 1874, February 17.—No. 597.

ARNHEIM, Felix, of No. 43, Ampthill Square, in the county of Middlesex.—(*A communication from Arnold Stoffler, A. Schmittzehe, and Friedrich Klett, of Stuttgart, in the German Empire.*)—" Improvements in " lithographic presses."

This invention relates to apparatus for lithographic printing of the kind in which the sheet is drawn with the stone or plate under a pressing rubber, the object of the improvements being such mechanical connection of the various movements that all are worked from one rotating shaft. The table, on which the stone or plate is adjusted to level by set screws, is caused to reciprocate on runners by the action of a crank; the rubber is raised and lowered by the action of a cam which can be adjusted in its dwell to suit different lengths of sheet; the inking is effected in the ordinary way; moistening rollers are raised and lowered by connection with the rubber; and a tympan sheet with tapes is also worked by the rubber movement. A registering cylinder may be applied for feeding the sheets, such cylinder moving in gear with the table in one direction, but resting while the table returns, and having grippers opened and closed by a cam action for taking the sheet from a feed table furnished with oscillating register needles, and applying it to the stone or plate, so that it may be carried therewith under the rubber.

A.D. 1874, February 17.—No. 598.

YARROW, Edward Henry, of Camberwell Park, in the county of Surrey, gentleman.—" Improvements " in the manufacture of gas, and in the apparatus connected therewith."

By means of a retort divided into compartments or tubes and heated to a high temperature, hydrocarbon vapour mixed with atmospheric air is transformed into a permanent gas.

A.D. 1874, February 17.—No. 599.

WILLIAMS, Samuel de la Grange, the younger, of Birmingham, in the county of Warwick, lime merchant, and **SCOTT, Henry Young Darracott**, of Ealing, in the county of Middlesex, Major General, C.B.—" Improvements in kilns for burning lime and cement."

In this invention we take advantage of any sloping bank or cliff that may be conveniently situated, and we build the kiln with its dais inclined at an angle of 60° more or less, the bank or cliff forming the inner or under wall of the kiln; and by such means great saving of cost is effected in erecting such kilns, and economy of labor is gained in drawing them.

A.D. 1874, February 17.—No. 600.

SANDERSON, Solomon, and **PROCTOR, Albert**, electric engineers, Shore Works, Huddersfield.— " Improvements in stoves, grates, or fireplaces."

Our improvements consist in so constructing stoves, grates, or fireplaces, and the flue or flues in connection therewith, that the draught which in ordinary fireplaces enters through the bars at the front and underside of the grate and then passes upwards to the chimney, shall in our improved grate enter from above the fuel, and also through the front bars, passing thence in a downward direction, making what is termed a down draft before passing up the chimney.

A.D. 1874, February 18.—No. 601.

McBEATH, Charles, of South Cobbinshaw, in the county of Edinburgh, North Britain, carpenter.—"Improvements in retorts and apparatus connected therewith, for the purpose of distillation and calcination "of minerals, parts of which are applicable to other purposes."

This invention consists first of improvements upon the retort or still and condensing apparatus, described in the final Specification of the invention for which Royal Letters Patent were granted to the petitioner, dated 29th October, 1866, No. 2788, for the distillation of shale and coal, for the production of oils, paraffin, tars, and ammonia, and illuminating gas therefrom, and also for calcining ironstone and limestone for the usual purposes of making iron and ardent lime, and also for the new purpose of obtaining crude oil and tar, and carbonic acid and sulphuric acid from the former, and chlorine and carburetted hydrogen from the latter; and secondly, of a new or improved construction of fluid exhausting and forcing apparatus or pump for drawing off the gases as they are evolved in the retorts, and in forcing them through or into condensers of either the improved construction referred to under the first part of this invention, or it might be of other retorts or stills and condensers for treating and obtaining the substances stated.

The nature of the improvements under the first part consists in making the conical retort square or rectangular at the lower open combustion mouth a short distance above the furnace bars, which are round and hollow with angled projections on them, for being turned at intervals by wheels and motive power, or a hand winch for the distillation of shale, but for ironstone and lime these bars are not required. An annular or narrow space is left between the outside of the retort, and the inside of its close heating chamber or outer brickwork, supporting the retort above the hearth, and having a flue and controlling damper at top leading to a separate chimney for each retort, or to a chimney for or common to a set of retorts. Another improvement consists in placing the conical feeding vessel, concentric at top, with a neck charging pipe dipping down into the mineral being treated, below the branch or pipe at top for drawing off the gases as evolved, by the new or improved exhausting or forcing machine, which consists of a large hollow double concave dome-ended vessel, with an elastic or flexible disc or diaphragm, jointed tightly between flanges formed in the centre between the said ends, so as to form two suction and discharge chambers out of the said vessel, by the reciprocating of the said diaphragm to and fro within it as a piston by the action of a rod working out through a stuffing box at one end, having its inner end attached by broad circular disc flanges to and on each side of the middle of the diaphragm, so that it and the rod are actuated, by a connecting rod and crank from any adjacent motive power engine or geared shaft. The gases are drawn off from the top of the retort through entering ducts and valves into each chamber on the in-stroke, and discharged through outlet valves and ducts on the out-stroke into the condensing apparatus, which may be of the construction described in the Specification of the inventor's said former patented invention, or of other forms and arrangements of condensers, such as a number of close condensing vessels, with the inlet forcing pipes led down some inches into the condensed liquids in them, and the outlet branches or ends led away from the top of each vessel, so as to conduct the gases not condensed down into and through the condensed liquids of the next vessel in succession, the last vessel or its duct having an outlet valve to conduct the permanent gases to a chamber, for subsequent use, as when inflammable for lighting and heating purposes, or for being led by a pipe back into the hearth of the retort to assist in the distillation or calcination of fresh mineral.

A.D. 1874, February 18.—No. 602.

GRIFFITHS, George, of Birmingham, in the county of Warwick, sewing machine shuttle and materials manufacturer.—"Improvements in sewing machine shuttles and reels."

According to this invention the yielding or elastic centre of the shuttle in which the end of the reel spindle is supported is made of a flat convolute spring resembling a watch spring, but with the coils wrapped close to each other. This spring is soldered or fixed in a hole in the middle of a bearing plate, the said spring having fixed in its axis a centre piece in which the reel spindle works. An elastic centre is thus formed which yields in the direction of the length of the shuttle, but is incapable of yielding laterally or at right angles to the axis of the shuttle. The bearing plate may be omitted and the flat convolute spring be connected directly to the shuttle. The flanges of the reel of the shuttle are raised from sheet metal in dies, and are secured to the reel spindle by pressure.

A.D. 1874, February 18.—No. 603.

BAILLE, Michel, of Faubourg, St. Honoré, No. 124, at Paris, engineer.—"An improved multiple tool."

This invention relates to a tool consisting of two members, the first of which is so shaped that it can be used by itself as a hammer, a measure, or a screw-driver or for drawing nails: the second is so formed that it alone can be employed as a scraper, rasp, or file, or for opening boxes: and the two members coupled together by passing the shank of the first through a mortice in the second, can be made to act as a pincers, vice, universal spanner, or pipe tongs.

A.D. 1874, February 18.—No. 604.

KITCHIN, John, of Sheffield, in the county of York.—" Improvements in boilers and steam generators."

This invention relates to the construction of steam boilers and steam generators, either vertical or horizontal, and consists in the application and use of wholly or partially corrugated plates of iron, steel, or other metal in the construction of the flues, cross tubes, or shells of vertical or horizontal boilers and other steam generators, principally at those parts exposed to the action of the fuel, for the purpose of increasing the amount of heating surface, and thereby reducing the consumption of fuel.

A.D. 1874, February 18.—No. 605.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex. —(*A communication from Gottlieb Wilhelm Daimler, of Muelheim on the Rhine, in the German Empire, civil engineer.*)—" Improvements in gas-motor engines."

This invention relates to improvements in gas-motor engines of the kind described in the Specons. of Patents Nos. 434 of 1866 and 2245 of 1867.

They consist chiefly in the construction and arrangement of a crank and levers and rods connected thereto for working the slide and for partly moving the piston, such crank being either moved by the engine shaft, or left at rest according as a pawl mounted on it is engaged with or disengaged from a ratchet wheel on the engine shaft. The engaging and disengaging of the pawl is effected by the movement of the piston in its descent and ascent, and is also controlled by a governor in such manner that when the engine shaft is revolving with sufficient speed the expenditure of gas is stopped.

The slide is arranged for the admission of the combustible gaseous mixture and of an igniting flame to the cylinder, and for the emission of the products of combustion from the cylinder by one and the same passage.

The engine shaft is carried on brackets projecting from a ring fixed on the top of the cylinder, arranged so that the piston can be taken out without dismounting the shaft. The piston rod has a groove at the back working on a dovetailed guide on a bracket fixed to the top of the cylinder; and beneath this bracket is a caoutchouc buffer against which the piston can strike.

The toothed ring of the clutch apparatus is of wrought iron fixed to cast iron nave loose on the engine shaft having a lip shrunk on the toothed ring: this nave has a boss projecting into a recess in the nave of the clutch apparatus, into which recess the oil escaping from the loose nave, drops, whence it flows out through a pipe.

The water jacket is made to extend to the top of the cylinder so as to afford sufficient capacity to render its continuous circulation unnecessary.

A.D. 1874, February 18.—No. 606.

HUNT, Bristow, of Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from the Enterprise Manufacturing Company, of Philadelphia, Pennsylvania, in the United States of America.*) —" Improvements in the construction of grinding mills."

The objects of this invention are, *firstly*, to allow of ready access to the interior of a hand grinding mill; *secondly*, to securely retain the working parts of the mill within the casing without interfering with their ready removal when necessary; *thirdly*, to prevent waste of the material to be ground in its passage from the hopper to the space between the burr and shell; *fourthly*, to facilitate the adjustment of the grinding surfaces of the mill for coarse or fine grinding; *and fifthly*, to insure the proper durability of the burr.

A.D. 1874, February 18.—No. 607.

FREUND, Amelia Louisa, trading under the name of Amelia Lewis, of Southampton Street, in the county of Middlesex, authoress and editor and publisher of " Woman's Opinion."—" An improved system " or method of domestic cooking, and improved apparatus and utensils to be employed therein."

This invention relates to an improved system or method of domestic cooking, and to improved apparatus and utensils to be employed in carrying the same into practice, the object of the invention being to prepare food for human consumption, so that the human stomach may be able to digest the same or assimilate the substances contained therein to the requirements of the body more easily than if the food were prepared or cooked according to the systems or methods hitherto in use.

The improved system consists in cooking or preparing the food by the circulation round or about it of dry heat radiated from the fire or of moist heat or steam generated thereby from water contained within the same utensil, whilst the said food is enclosed from contact with atmospheric air.

In order to carry this system into practice I have found it necessary, *firstly*, to devise a more effective heating apparatus or cooking stove, one of such a character as to be specially adapted to the economical consumption of peat or peat coal, and in which the fire is completely under control; and *secondly*, to devise improved cooking utensils separately adapted to their special requirements.

The object I have sought to accomplish in carrying my ideas into practical effect have been to make the fire as small as possible and to retain the heat developed therefrom as long as possible in order that it may disperse itself more completely among all the cooking utensils in use, and not be allowed to escape wastefully up the chimney or flue immediately it is developed as in ordinary open fire places.

A.D. 1874, February 18.—No. 608.

KEMP, Francis, of Ashton under Lyne, in the county of Lancaster.—" Improved apparatus for coupling " and disconnecting railway trucks."

My invention is designed for the purpose of effecting the self-acting coupling of railway trucks by merely pushing the trucks together, and to afford a ready means of disconnecting them by a lever placed at the outside, so that there is no necessity for a porter or other person to pass in between the trucks for either the coupling or disconnecting the same, and by these means not only is a very great saving of time effected but accidents from the above cause will be entirely prevented.

A.D. 1874, February 18.—No. 609.

KIRKWOOD, John Townsend, of Ireton House, Cheltenham, in the county of Gloucester, gentleman, and SMITH, Wade Hampton, of Edgbaston, Birmingham, in the county of Warwick, civil engineer.—" Improvements in treating metals by subjecting them to the action of gases charged with carbon, and in " apparatus employed therein."

The invention relates to the treatment of metals, and in particular iron, by subjecting it while it is heated, in suitable vessels, pots, or retorts, to the action of the products obtained by the ignition of gases charged with carbon, such as carburretted hydrogen or hydrocarbon gases, the combustion of the gases being effected in chambers or tubes into which a suitable quantity of atmospheric air is admitted, and the products of the combustion being conducted through suitable openings made in the heating vessels and caused to act upon the iron contained therein, which is thereby carbonized and to a considerable extent purified, the carbonization being effected in a more certain, speedy, and economical way than has hitherto been practicable.

A compound burner is described in which the gas is first ignited at the end of a tube which is enclosed in another tube or chamber, into which a regulated amount of atmospheric air is introduced; the products of the combustion so effected are passed from the inner tube or chamber through a burner, which in turn is enclosed in another chamber or tube which is also supplied with atmospheric air, the supply being regulated as before by valves or slides. The products of the combustion so effected are conducted through a suitable pipe and may be directly introduced through a suitable opening in the heating vessel, pot, or retort, or the products may be stored in a suitable receiver ready for use as required.

It is obvious that other forms of burners may be used to effect a like object; also that instead of employing atmospheric air nitrogen gas may be employed.

The form of furnace adopted for this purpose when treating scrap iron or broken pieces in pots is one in which the flame and products of combustion from the fire pass by channels into chambers containing the heating pots, and thence the flame or products of combustion pass away by suitable passages to the chimney or stack.

Chambers are also provided beneath those to contain the pots or retorts with communication between the one and the other to facilitate the conducting of the gas and to enable the attendant to regulate the supply of the gas.

A.D. 1874, February 18.—No. 610.

KIRKWOOD, John Townsend, of Ireton House, Cheltenham, in the county of Gloucester, gentleman, and SMITH, Wade Hampton, of Edgbaston, Birmingham, in the county of Warwick, civil engineer.—" Improvements in treating metals by subjecting them to the action of gases or vapours, and in apparatus " employed therein."

These improvements relate to when employing gas or vapor obtained by the admixture of vegetable carbon and hydrochloric or nitrous or nitric acid, combined in some cases with coal gas, in the treatment of molten metals.

In carrying out the improvements the hydrochoric acid is placed in one chamber, the wood naptha or vegetable carbon in another chamber, and nitric acid in another chamber. The gases or vapors from these respective chambers are capable of being conducted together or separately into a passage through which a current of atmospheric air is caused to flow, so that the atmospheric air alone or combined with any or all of these gases in any required proportions may be conducted to the converter or other vessel containing the molten metal; or any or all of these gases or vapors may be forced into the converter or other vessel referred to uncombined with atmospheric air.

Or the gases or vapors as described in the Provisional Specification of Letters Patent applied for by us on this 18th of February, 1874, may be employed to operate on the molten metal.

A.D. 1874, February 18.—No. 611.

RUSTON, Joseph, of the Sheaf Iron Works, Lincoln.—" Improvements in apparatus for feeding thrash-" ing machines."

This Provisional Specification describes feeding forward corn to thrashing machines by means of parallel spiked rollers. At the delivery end of the series of rollers, and above the thrashing drum, there is another similar spiked roller revolving at a quicker speed, and in the opposite direction, for the purpose of opening the sheaves and throwing down the corn. An oscillating spiked bar above the rollers may also be used for opening the sheaves. Beneath the rollers is an inclined reciprocating board to catch any detached ears of corn, and carry them forward to the thrashing machine.

A.D. 1874, February 18.—No. 612.

CONNOR, Charles Cunningham, of Belfast, in the county of Antrim, Ireland, manufacturer.—" Im-" provements in the preparation of yarns and fibrous substances."

My invention is particularly beneficial when applied to yarns of flax hemp, cotton, and other fibres; and consists in so treating the said yarns that they are considerably increased in strength and rendered in a state very favourable for their being woven. My invention is also applicable to the preparation of sewing threads and twines, and for the yarns from which they are made. To carry into effect my invention I saturate the yarns by any convenient method, with a solution of glycerine and water.

A.D. 1874, February 18.—No. 613.

LONG, Richard, of Liverpool, in the county of Lancaster.—" Improvements in and applicable to heating " flat irons for laundry purposes, and in apparatus employed therefor."

An apparatus constructed according to this invention consists of a sheet of iron stamped, cut, or cast to the shape of the base of the flat iron. On the sides of this sheet of iron are formed two projecting lugs, or provisions so made as to clip the bevelled edge of the base of the flat iron. At the top of the apparatus (which may be termed a hanging holder and guard) is formed a hook, or other provision for hanging the apparatus on the fire bars of the grate. In some instances these hanging holders or guards may be made to hold two or more irons by having suitable lugs or provisions fixed thereon to act as clips or supports to the flat irons. In some instances the apparatus may be formed of a thin plate of cast iron, having lugs or provisions cast thereon to act as clips or supports to the bevelled edges of the base of the flat irons, the plate being hung to the bars of a fire grate by suitable hooks or provisions attached to the sides of the plate.

A.D. 1874, February 18.—No. 614.

ALLEN, John Franklin, of New York, in the county of New York, state of New York, and in the United States of America.—" Improved mode of strengthening cannons and other cylinders."

The nature of my invention consists in forging, rolling, or casting thin metallic rings or plates, either conical or with radiating corrugations, and then pressing these rings or plates straight when cold, so that the strain arising from any pressure acting against the inner circumference will be more equally distributed between the inner and outer circumference.

A.D. 1874, February 18.—No. 615.

HYNAM, John, of Wilson Street, Finsbury, in the county of Middlesex, manufacturer.—" Improvements " in the manufacture of cigar lights, matches, and other similar articles, and of wicks for lamps, candles " and other like articles, and in apparatus employed therein."

This Provisional describes the manufacture of incombustible stems for cigar lights, &c., and of incombustible wicks for lamps, &c. from asbestos.

A.D. 1874, February 18.—No. 616.

HALEY, Sam, of Bramley, near Leeds, in the county of York, machine maker.—" Improvements in " machinery or apparatus for splitting hides or skins."

This invention relates to the construction of the knives employed in machinery of this class.

I construct such knives of separate parts, the back part of the steel (on which the cutting edge is to be formed) is received within a recess or groove formed in the back or other portion of the knife, the two parts are then secured together by rivets or countersunk screws, or are brazed or soldered together, or the portion of the knife on which the cutting edge is to be formed, may extend over and beyond the back or other portion of the knife and secured thereto as aforesaid.

A.D. 1874, February 18.—No. 617.

EGERTON, Philip, of Cleveland House, Cheltenham, in the county of Gloucester.—" Improvements in " mounting spindles to be used for carrying revolving brushes, drills, and such like, to enable them to be " applied by hand in any desired direction."

The object of this invention is to transfer a very rapid revolving motion from a lathe or other wheel revolving in stationary bearings to a spindle which can be held in one hand, and (being fitted with different kinds of brushes or with a drill) may be applied in a horizontal or vertical direction to any part of an object either fixed or held in the other hand.

A.D. 1874, February 18.—No. 618.

MACGEORGE, Ivie Mackie, of North Ormesby, Middlesborough, in the county of York.—" Improve- " ments in appliances for regulating the speed of steam and other like engines."

These appliances are composed of a balanced disc or wheel, plain or weighted, or provided with blades which can be set to any desired angle, such disc or wheel being attached to sockets, and a portion of which is threaded to ride upon a threaded portion of the governor spindle and rise and lower thereon, to close and open the valve by acting upon the valve lever in the manner well known.

A.D. 1874, February 18.—No. 619.

TOUSSAINT, Joseph, of No. 64, Larches Street, Sparkbrook, Birmingham, in the county of Warwick.— " Improvements in moulds for casting metals, and in coatings for such moulds."

Cores are made of segments and coated with plumbago, also the moulds and boxes. A central rod or butt with springs is employed to facilitate removal of casting in some cases.

A.D. 1874, February 18.—No. 620.

KEATS, John, of Newcastle, in the county of Stafford, boot maker, **GREENWOOD, Arthur**, of Leeds, in the county of York, engineer, and **KEATS, Alphonso**, of Newcastle, in the county of Stafford, boot maker.—" Improved machinery for manufacturing boots and shoes, part of which improvements is appli- " cable to sewing machines generally."

The first part of the invention relates to the feeding mechanism applied to two kinds of the well known Crispin machine, viz., the post and the horn or bracket arm machine.

Secondly, to an improvement in lasting boots and shoes, the same being effected by a modification of the heel and the blocking machine patented the 14th day of February, 1867.

A.D. 1874, February 18.—No. 621.

TOPPING, James, of Preston, in the county of Lancaster, engineer, and **GREGORY, Joseph**, of Preston aforesaid, engineer.—" Improvements in and machinery for cutting or forming clay and other plastic sub- " stances into bricks, blocks, or slabs."

This invention consists in—

First. The use of a frame with dividing wires placed horizontally over the clay and worked vertically for the purpose of dividing the clay into bricks or blocks by means of a weight or lever or other mechanical device. Secondly. The use of a plate or weight resting upon the dividing wires, and so arranged that when the wires enter the clay the plate or weight will remain on the surface of the clay being divided, until the frame with its dividing wires is again raised, thus preventing by its weight the blocks from being lifted out of position by the wires during their return motion through the clay. Thirdly. The use of a moveable board serving as a table upon which the bricks may be cut, and upon which they may also be carried away from the machine in the position in which they were cut.

The invention is applicable to cutting other plastic substances besides clay into blocks or slabs.

A.D. 1874, February 19.—No. 622.

SIEBERT, Oscar, of the city and state of New York, United States of America, now of 8, Southampton Buildings, London.—" Improvements in gas-light apparatus."

My invention relates to apparatus for increasing the steadiness and brightness of the flame of a gas burner for regulating and economizing the consumption of gas and for preventing the production of smoke therefrom.

A.D. 1874, February 19.—No. 623.

CLEGG, Thomas, and LUCAS, Thomas, both of Miles Platting, Manchester, in the county of Lancaster. —" Improvements in arrangements for effecting the grinding of the travelling flats of carding-engines."

According to this invention each travelling flat in a carding-engine is moved towards the grinding roller when being ground, until the surfaces which slide on the flexible bend bear against guides or sliding blocks.

A.D. 1874, February 19.—No. 624.

COCKEY, Henry, and COCKEY, Francis Christopher, both of Frome, Selwood, in the county of Somerset.—" Improvements in furnace doors."

This invention consists in constructing the furnace door with a frame of cast or wrought iron, the inner edge of the frame being bevelled, so that the smallest part of the opening is inside the door. A brick, tile, or slab of fire clay is moulded with a corresponding bevel on its edge, so as to admit of its being inserted in the opening of the furnace door and projecting somewhat beyond the interior surface thereof. In order to ensure more perfect contact between the brick and the furnace door, the brick is bedded in with " Sellar's cement," fireclay, or other suitable matter or cement. The upper or outer surface of the brick is also served with the same sort of cement or fire clay, and a cast or wrought iron plate is then placed on it and secured to the frame of the furnace door by bolts and nuts or other suitable means.

A.D. 1874, February 19.—No. 625.

ARIS, John Jordan, of No. 20, High Holborn, in the county of Middlesex, engineer.—" Improvements " in the construction of horse shoes."

My invention consists in forming horse shoes with a series of grooves on their outer surfaces in a manner similar to the wheels of traction engines.

A.D. 1874, February 19.—No. 626.

WHITMORE, Charles Edward, of Quincy, in the county of Adams, and state of Illinois, in the United States of America.—" Improvements in purifying middlings."

My invention has for its object to improve the method and means of treating that portion of ground grain called " middlings " for the production of flour of a superior grade.

To this end the invention consists, first, in an improved process for purifying the middlings; and, secondly, in the machinery for working the process in whole or in part.

I will first describe the process and lastly the machine and its various modifications.

In treating the middlings according to my process they are passed into a machine or machines provided with a spreader and feed trough by which they are distributed evenly onto and across a screen. By a peculiar motion of cams or other equivalent devices the middlings travel rapidly over the bolt or screen and are subjected to a blast of air forced up through them to act upon the fine brown and fuzzy particles and hold them in suspension. The strong current of air ascending between the screen and sides of the machine remove these particles and deposit them in one or more dust chambers or rooms. The tapping motion imparted to the screen by the cams or other equivalent devices raises the light brown particles to the top, and as the middlings pass along the screen or bolt they are sifted through free from all impurities.

A portion of the screen extends outside the machine at both ends, and that portion outside the feed end is covered with fine cloth or other suitable material to admit of the light brown particles being raised to the top, before entering the machine to be treated by the air.

That portion of the screen or bolt extending outside the machine at the discharge end is covered with heavy coarse cloth for sifting the coarse middlings through into a hopper from which they are carried to another machine or machines until all of the fine middlings are purified.

All the middlings that pass through the screen or bolt in the machine are purified and ready for grinding, while that portion, if any, that passes over the end is the poorest offal.

The very coarse middlings and the heavy brown particles generally known as tailings and which are wasted by other machines require a different operation from the middlings proper. I therefore take them to another machine or machines arranged preferably with a sectional graduated suction fan or a series of suction fans so arranged that the desired currents of air shall be drawn up through the screen or bolt and its covering at any and all parts thereof.

As the middlings enter the machine or machines a light current of air is required to carry off the lighter particles raised to the surface by the motion of the screen.

As they approach the discharge end a small portion of the middlings remain (the greater part being heavy brown cuttings) and therefore a strong current of air is required through the bolt or screen. All the middlings are consequently purified without returning or wasting any portion of the valuable substance.

The necessity of employing a light blast through the middlings as they come from the reel or bolt in order to prevent waste is obvious to any intelligent miller.

The peculiar lifting movement given to the bolt or screen raises the middlings sufficiently to permit the passage of the air currents through them without disturbing or mixing the white and brown particles together.

The middlings from each machine are conveyed to the stones for grinding, and are then bolted and preferably mixed with the flour from the first grinding, thereby producing a superior quality of flour, rich in gluten and containing less impurities than that produced by any other known process.

The gluten contained in the middlings when combined with the portion of the wheat increases the value and adds strength and richness of color to the flour that in the ordinary treatment are wanting.

The first stage of my process is of great value. The middlings being distributed evenly in a fine sheet on the bolt or screen, the tapping or percussion movement raises the light brown particles on top, while the lifting movement throws them up sufficiently for the upward passage of the air currents through them. This admits the use of lighter ascending currents of air than have hitherto been employed. These currents hold the light brown specks and fuzzy particles in suspension, while the currents that pass up between the bolt and the sides of the machine, being much stronger, carry such impurities into a dust chamber or chambers, thus securing a perfect separation without waste.

The last stage of my process is highly important, from the fact that a portion of the middlings and cuttings, commonly called "tailings," are almost of the same specific gravity; therefore as they enter the suction machine from the blast machine a very light current or suction is used.

As the quantity of middlings decreases, however, the remainder is subjected to a stronger current of air, thereby effecting a perfect separation of all the middlings without waste.

A very important advantage of the process is that no change in grinding is required, nor is a change in bolting necessary; the same cloths are employed as in the common method. Another advantage presented by [*my**] process is that it does not decrease the capacity of the mill.

I will now proceed to describe the machinery required to carry my process into effect or an analogous process, and a slight modification in the construction and arrangement of such machinery; and to that effect :—

I construct a substantial frame, within which a screen or bolt covered with wire and bolting cloth is suspended by means of links or hangers; and the apparatus is further provided with a sectional fan, the openings of which have slides for graduating and regulating the currents of air.

Motion being imparted to the machine by means of a main driving shaft, and the screen is actuated by means of cams affixed to such main driving shaft.

The middlings are fed onto the screen and are carried forward by the vibratory motion of such screen, imparted to it by the cams affixed on the main driving shaft, and as the middlings enter the machine they are subjected to a light current of air passing up through them, a result obtained by having the first section of the fan smaller than the others, together with the slides for regulating the openings in the fan.

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* The word "my" is found in the copy of the Abridgment delivered by the Applicant, but does not appear in the original Abridgment.

The next section of the fan is made larger, thereby increasing the force of the blast in connection with the adjustable slides. The lower or last section is the largest, and of such size as shall create a blast sufficiently strong to carry off the brown particles. By these means a perfect separation of the valuable portion of the middlings from the refuse matter is effected.

The fan or fans may be arranged transversely of the machine and screen, so that the currents of air shall be drawn directly upward from the sides of the screen to the end openings of the fans, and upward and outward from all points between the sides. The currents of air by this arrangement are drawn up through the entire length of the screen, varying in force according to the size of the fans and the adjustment of the openings by means of the slides.

The machine is further provided with an opening on each side below the level of the screen or bolt, for the admission of air through such screen, and between it and the machine passing up to the openings in the fans or fans as above described. The apparatus is also provided with a hoppered box for the reception of the purified middlings, from which they are removed by means of a conveyor to the blast machine, which is constructed of a substantial frame, and also provided with a screen covered with wire and bolting cloth, and suspended by means of links. This machine is further provided with a blast fan at one end and below the screen, forcing a current of air into a tube or trunk connected with the mouth of such fan, and extending longitudinally of the machine under the screen.

This tube or trunk has openings in its sides and top, which may be regulated at will by means of slides provided with rods or handles projecting through the end of the machine, and over the openings on top of the tube or trunk a triangular bar is so arranged as to prevent the middlings from falling into such openings, and at the same time spreading the currents of air as they escape from the tube or trunk.

Partitions are arranged under the bolt or screen in such manner as to enable the operator to further regulate the air blasts passing upward through such bolt, and at the same time permitting a heavier blast through any portion of the bolt if required.

The middlings being fed into the trough affixed to one end of the screen, from which they fall on such screen, and as they enter the machine are caused to sift through rapidly, the bran and brown specks being prevented from accompanying the middlings by means of the air blast.

The coarse bran moves off over the end of the screen, and the dust and fine particles are carried up and deposited in a dust chamber.

The air from the fan is forced first into the air chamber and thence passes into the compartments under the screen through the apertures in the air tube.

The partitions are so arranged that the different air currents cannot pass from one compartment into the other, thus securing in each section a sufficient current of air to remove the brown specks according to their specific gravity. Thus at the upper end, where the middlings are light, a light blast is required, the openings in the air tube being adjusted in proportion to the coarseness of the middlings.

I will now describe a slight modification of the apparatus combining both the suction and blast fans.

The frame in this modification is divided into two compartments by a vertical partition, and a bolt or screen extending through both compartments and projecting through both ends of the machine. This screen or bolt is suspended within the frame by means of pivoted hangers and that end of the screen projecting at the feed end is formed into a tight smooth surface, upon which the middlings fall from the feed trough, which is secured to such projecting end.

The screen has a horizontal, and at the same time a vertical motion, imparted thereto by means of a ratchet wheel affixed on the main driving shaft; and a roller affixed on the end of the screen, upon which roller the ratchet wheel acts; and a spring or springs affixed to the feed end of the screen on each side under such screen. When the machine is in operation, the ratchet wheel acts against the roller to throw the screen in a direction against the tension of the springs, which springs throw the screen back again every time the teeth of the ratchet wheel slip off the roller. In the backward throw effected by the springs the screen or bolt strikes against a strip of hard wood affixed to the end of the frame, and by this action a sharp, quick percussive blow in a horizontal direction is given to the screen causing the middlings to travel rapidly over its surface; a vibratory motion being at the same time given to such screen to keep the meshes from clogging.

A tube or receiving spout is affixed to the opposite end of the machine, and extending entirely across its width, into which the middlings enter through a suitable opening and by means of a spreader board, by which they are spread across the entire width of the tube. As the middlings drop down to the feed trough, a current of air from a suction fan affixed on top of the tube passes upward through such middlings, carrying off the lightest fuzzy particles, and at the same time the middlings, as they fall in evenly distributed quantities are cooled by such upward current. The middlings are fed to the screen through perforations in the bottom of the tube or by passing over its lower edge, so as to cover the surface of such screen with a thin layer or coat.

The vibratory as well as the oscillating movement of the screen is of course imparted to the middlings, thus permitting the air currents to pass through them freely, thereby raising and carrying off through a suitable opening at the top of the compartment the light brown particles and deposit them into a suitable dust chamber.

The pure middlings pass through the cloth into a hopper and are carried off by a conveyor to the stone.

That portion of the screen extending into one of the compartments is covered with cloth of proper size to clean the coarse middlings, which, as they pass over the screen, are operated upon by a current of air from the suction fan, such current of air being sufficiently strong to remove the heavier brown particles.

The trunk of the blast fan conveys the air blast into the other compartment through suitable openings; above each of these openings is placed a strip of wood or other suitable material to assist in distributing the air evenly into the compartment.

A small space is left between the edge of the screen and the sides of the machine through which the air passes in a strong unobstructed current toward the opening, carrying off all the fine dust as it is raised from the screen by the air passing through the bolt.

A.D. 1874, February 19.—No. 627.

NEWHOFF, William, of Brunswick, in the Dukedom of Brunswick.—" Improvements in baths or bath-" ing tubs."

This invention relates to heating a bath by partitioning off a portion of it at one end with a porous screen, and placing in the portion so partitioned off a slow combustion stove to heat the water, which freely circulates, while the bather is protected by the screen.

A.D. 1874, February 19.—No. 628.

HUGHES, Edward Thomas, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London. —(*A communicaeion from Eli Whitney, of the city and county of New Haven, in the state of Connecticut, United States of America.*)—" Improvements in breech loading fire arms."

This invention relates to an improvement in breech loading fire arms; the first part of the invention to that class in which the breech-piece is hung below the barrel and swings back and downward to open the breech; the second part to those in which the breech-piece swings laterally from the breech; the third part to those in which the breech-piece is hung to one side of the barrel to swing transversely to open the breech.

A.D. 1874, February 19.—No. 629.

LEONI, Sigismund, of 34, Saint Paul Street, New North Road, in the county of Middlesex, manufacturer. —" Improvements in heating and cooking apparatus."

In heating apparatus heated by means of gas or oil, a condenser is employed in order to separate the aqueous vapour from the gaseous in the products of combustion, and facilitate the escape of the noxious gases, the water of condensation passing from the condenser through a syphon, and the noxious gases through a flue of smaller diameter than usual.

In apparatus for cooking by gas, the several processes of roasting, baking, steaming, and water boiling can be carried on simultaneously by the combustion and arrangement of the parts.

A.D. 1874, February 19.—No. 630.

TERRACE, James Bogie, of Dysart, in the county of Fife, North Britain, engineer.—" Improvements in " mechanism for working steam engine valves."

This invention consists in arranging two eccentrics or cranks, or other equivalent parts, to act on the slide valve, one giving the ordinary movement to the valve, which movement is regulated principally with a view to the best conditions for the exhaust, whilst the other gives a movement for shifting the valve so far as to cut off the steam at any point that may be desired, but not far enough to interfere with the exhaust. The desired action is rendered possible by arranging driving parts from the eccentrics or equivalents to work in slots or between stops on driven parts connected to the slide valve, so that each driving part has at each of its strokes or traverses to move inoperatively along the slot or between the stops for a certain distance before acting on the driven part.

A.D. 1874, February 19.—No. 631.

CLARKE, Alfred Butler, of Nottingham, in the county of Nottingham, but temporarily of 4, South Street, Finsbury, in the county of Middlesex.—"An improved washing machine."

A vertical rocking lever having a counterweight at its lower end, and a handle at its upper end, works on a fulcrum or centre at the side of a suitable tub or case. This rocking lever is connected by jointed arms to vertical axes, one of which passes through the bottom of the tub, and the other through a cross-piece on the top of the tub. These axes carry at their inner ends a number of horizontal arms or beaters arranged radially.

A.D. 1874, February 19.—No. 632.

PEEL, John, weaving manager, and **EMSLEY,** Sidney, agent, both of Bradford, in the county of York. —"Improvements in looms and pickers."

This invention relates to employing grooves formed in the shuttle box bottom and cover for the purpose of guiding the picker and check; also in employing pickers made of sizing or hides, full and solid, or in detached parts, and to the checking of the shuttle and picker, and lubricating the picker spindle.

We drive and check the shuttle by means of a picker, made whole and of sizing or hides, and also a check working in two grooves formed in the shuttle box, one at the top in a cover fitted on the top of the shuttle box, the other in the bottom of the box. Our pickers are made in detached parts, and in conjunction with each other. The part of the picker, made heretofore in sizing, is made of metal, being a tube or part of a tube, having projecting pieces; this tube works on a spindle so arranged that the picking strap can be fixed round the tube or on an arm or rib connecting the ends of the part of a tube, the projecting piece enters loosely into a loose long picker, the bottom part of the picker works in the groove formed in the bottom of the shuttle box; this part is made of sizing, or of any other suitable material; a flat hole is made going through one of the ends or through the middle, into which the projecting pieces enters loosely; the bottom part of the picker, made of sizing, is made full and solid to receive the impetus of the shuttle.

For checking the shuttle an apparatus is employed, made of metal, in which is formed a chamber or recess, in which is placed felted wool, or any other material capable of holding oil; the picker spindle passes through the metal chamber and felted wool. On the chamber is cast a projection to which a check strap is attached.

A.D. 1874, February 19.—No. 633.

DAWSON, Dan, of Milnes Bridge, in the county of York, aniline manufacturer, and **SLATER,** Clayton, of Barnoldswick, in the county aforesaid, cotton spinner.—"Improvements in dyeing, and in apparatus "connected therewith."

This invention consists in the use of improved means and apparatus for dyeing and "fixing" the dye or colouring matter upon fabrics of cotton or other vegetable fibre or fabrics composed partly of cotton or other vegetable fibre, and partly of wool and other animal fibre, by passing same through the dye liquor and then through ammoniacal vapour, and in the apparatus connected therewith."

A.D. 1874, February 19.—No. 634.

PIVER, Alphonse, of No. 10, Boulevart de Strasbourg, Paris, in the Republic of France, perfumery manufacturer.—"Improvements in the distillation of essential oils or perfumes."

This invention relates to a process of distilling aromatic substances at a temperature higher than the boiling point, that is to say, a pressure of between 1 and 5 atmospheres. The apparatus used consists of a steam generator, a closed vessel to contain the aromatic substances, a cooler or condensing chamber, a vessel divided into compartments by vertical partitions and intended for regulating the flow of the liquid, and an apparatus for preventing overflow in case of sudden increase of heat.

Steam from water or alcohol passes from the boiler into the vessel containing the aromatic substances, and thence, laden with perfume, to a worm in the condensing chamber, whence it runs into the vessel for regulating the flow, passing successively up and down its compartments, a small quantity of essential oil being separated at the top of each compartment and falling into a bottle, the water flowing into another vessel.

In case of a sudden rush of liquid the irruptive flow falls into a swing box which brings a funnel under the outlet of the tube of the condenser, and the liquid is conveyed into an open vessel placed under the said swing box.

A.D. 1874, February 19.—No. 635.

MILLS, BENJAMIN JOSEPH BARNARD, of the firm of Harris and Mills, of 23, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from Nestor Rolland and Jean Vanhoorde, both of Brussels, in the Kingdom of Belgium.*)—" Improvements in wheel barrows."

The invention has for its object improvements in wheel barrows, such as are commonly used by labourers, and having only one wheel, and the improvements consist in mounting the axle of the wheel in bearings acted upon by springs.

A.D. 1874, February 19.—No. 636.

LOWE, SEPTIMUS, surgeon, and **WHITE, SAMUEL**, engineer, both of Lincoln.—" Improvements in appli-" ances for signalling on railways, especially during fogs and dark weather."

A wheel upon the engine rides upon a raised platform, under the action of a spring. The wheel has bevilled gearing attached for rotating a shaft by which a toothed sliding bar can be withdrawn from a cup to give a free fall to a weight on the whistle lever, and thereby open the communication, the whistle continuing until the toothed lever is replaced. The wheel may however ride against projections on the side of the line, the shaft by this means being rotated direct.

A.D. 1874, February 19.—No. 637.

RYDILL, GEORGE, of 8, Quality Court, Chancery Lane, in the county of Middlesex.—" Improvements in " steam generators or boilers, furnaces and flues, water tubes and water casing, applicable as a steam " generator for marine and land purposes to utilize the heat, and for other purposes."

This invention of improvements is to construct steam generators or boilers of great strength, great heating surface, and to improve the construction of water tubes, water casing flues and furnaces, with a self-feeding furnace to prevent smoke.

A.D. 1874, February 19.—No. 638.

KENT, GEORGE, of High Holborn, in the county of Middlesex.—(*Partly a communication from I. Adams, of Soleure, Switzerland.*)—" An improved apparatus or machine for cutting or slicing fruit, vegetables, and " other materials capable of being so treated."

The said invention relates to a simple, convenient, and efficient machine for cutting fruit and vegetables of all kinds, and other substances or materials capable of being so treated, into slices or pieces of any uniform thickness. The said machine may be advantageously not only for domestic use for slicing apples, potatoes, cucumbers, and other fruit or vegetables for daily consumption, but also by manufacturers of preserved fruits and vegetables, and others who require a strong and durable machine capable of slicing large quantities of various materials rapidly and economically.

A.D. 1874, February 19.—No. 639.

MELLOR, HENRY MOSES, and **WOODWARD, LUKE**, of the firm of Messrs. Moses Mellor and Sons, Arkwright Street, Nottingham.—" Improvements in rotary knitting machines."

This Provisional Specification describes employing radial arms set spirally round an axis to depress the sinkers. The axis has an oscillating revolving motion given to it. The Specification also describes mounting such of the needles as are to be thrown out of action when narrowing upon plates of hard metal, turning at their rear end on pins or hinges at the back of the needle bar, whilst their front ends rest in grooves in the verge at the front of the needle bar. One or both sides of the grooves are inclined. Means for throwing back the needles as they are put out of action are also described.

A.D. 1874, February 19.—No. 640.

DAVIES, WILLIAM HENRY, of 17 & 18, Cornhill, in the county of Middlesex, and **HIGGINS, FREDERICK HERBERT WILLIAM**, of 17 and 18, Cornhill, in the county of Middlesex.—" Improvements in electric " telegraphs for giving signals and alarms."

This Provisional Specification describes connecting a large number of stations to a central station. The transmitting instrument is provided with, say four finger keys. Depressing one of these keys causes a cam wheel to revolve once, twice, thrice, &c. according to the key. The revolution of the cam wheel transmits a signal consisting of a number of dots or dashes variously arranged, the cam wheel at each station being of a different form; and the signal is repeated once, twice, &c., according to the key depressed. Thus at the receiving station, the station from which the signal was sent, and what is wanted can at once be seen. An automatic fire alarm is also described in connection with this arrangement.

A.D. 1874, February 19.—No. 641.

HOLLAND, Henry, of Birmingham, tool maker.—" Improvements in the manufacture of gas for illuminating and heating purposes."

The Specification of this invention describes making illuminating and heating gas by charging air with the vapour of any suitable bituminous or hydrocarbon liquid, and submitting such combined gas to the action of a high degree of heat.

A.D. 1874, February 19.—No. 642.

WORRELL, Thomas Boyle, of the city of Philadelphia, and state of Pennsylvania, in the United States of America.—" An improvement in bank locks."

My invention relates to the following particulars. The bolt spindle has on its inner end a pinion which gears into a rack that has a connection with a dog for imparting a vertical motion thereto in connecting it with the combination wheels and disconnecting it therefrom. To prevent the dog being forced in by a burglar, it has a dovetailed head. The dog is connected to a vertical rack which impart motion through the bolt pinion to other racks in opposite directions by the up and down motions of the dog, the bolts are moved for locking and unlocking the door. The dog is so made, that if a burglar should attempt to remove the lower part by drilling, the screws will be cut and all connection with the bolts destroyed. Or if he should blow off or break the lock, the communication between it and the bolts will be severed. The tappets are of peculiar form and have their ends of the same width as that of the divisions between the slots of the wheels, so that the dog slots may be aligned when the tappets are set to any of the slots around the wheels. To defeat burglars in their mode of aligning the combination wheels by boring through the door to the lock and introducing an instrument, I connect idle wheels which are moved by the same spindle, so that when the instrument is inserted, the turning of the wheels would prevent the use of the instrument. These additional wheels may be used as combination wheels. There is a supplemental dog for keeping the above mentioned dog above the combination wheels during the interval of its disconnection from them, in a recess of the bed plate and to prevent the feeling of the combination by a burglar or lock picker. The dial is removable from the spindle to which it is attached, so that after the vault has been locked up by one who knows the combination, it may be carried away by one unacquainted with the combination, and as neither can open the vault without the other, if a burglar should make a prisoner of either, he cannot compel him to open the vault. The dial has a circumferential bead or flange around its outer corner to hide the figures from view when the vault is opened.

A.D. 1874, February 20.—No. 643.

TRUEMAN, Henry Pattman, late of John Street, Pentonville, in the county of Middlesex, and now of Woodbridge, in the county of Suffolk.—" Improvements in apparatus for measuring liquids."

My invention relates to a simple and convenient apparatus for accurately measuring all kinds of liquids The said apparatus is constructed with an outer case at the bottom of the said case or vessel. I admit the fluid to be measured till it reaches a level determined by a float connected with a valve. In the bottom of the said case I place a tube. The said apparatus also has a vessel fitted to slide vertically on the aforesaid tube. I effect the raising and lowering of the sliding vessel on the tube by means of a wheel and rack. I connect to the wheel and rack or other lifting arrangement a lever which describes an arc over the face of a graduated disc.

A.D. 1874, February 20.—No. 644.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Adolphe Broux and David Broux, of the firm of Broux Brothers, two persons resident at Roubaix, France, manufacturers.*)—" A new and improved axle or spindle sole or socket."

The invention consists in constructing the sole body with two transverse holes, but not passing entirely through the said body, and lying athwart one another, and with the vertical hole in which the axle or spindle pivot rotates, the outer apertures of the both holes being closed afterwards.

A.D. 1874, February 20.—No. 645.

JONES, John Allin, of Birmingham, in the county of Warwick, agent.—" Certain improvements in the " construction of sliding sashes."

The novelty of my invention consists in so constructing sliding window sashes, that they may be readily opened inwardly for cleaning, repairing, or other purposes.

A.D. 1874, February 20.—No. 646.

BYWATER, William, of the Sweet Street Foundry, Holbeck, Leeds, and **SMITH, Samuel**, of the Low Bridge Works, Keighley, both in the county of York.—" Improvements in apparatus employed in drawing, " spinning, or twisting wool or other fibrous substances."

In drawing, spinning, and twisting apparatus it is customary for the fibre to pass down direct from the delivery rollers to the spinning or twisting means, and the draft to these delivery rollers is effected by motion given to the lower of them, aided by the weight of the upper ones.

According to this invention the upper or pressing rollers may be omitted, and instead of passing each strand simply over the upper surface of its bottom roller, it is passed once or more times round such roller, and generally the surface of these rollers is formed of a square or other sided figure, or of ridges or flutings to facilitate the drag on the yarn.

These rollers may be repeated in some cases to act in succession on the fibre, to form holding or drawing rollers.

A.D. 1874, February 20.—No. 647.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Charles Wacker, dentist, and Martin Boll, restaurateur, two persons resident at the city, county, and state of New York, United States of America.*)—" Certain improvements in fenders and protectors for vessels."

The invention consists of a railing which encloses a vessel in combination with springs or cushions for the purpose of preventing injury to such vessel and of reducing the shock of resistance upon it and also to provide a ready means of escape in case of fire or shipwreck.

A.D. 1874, February 20.—No. 648.

PEAK, John, of Wigan, in the county of Lancaster. —" An improved combined system of weights, " measures, and coinage."

The principal novel feature of this invention consists in the manufacture of coins of such a given diameter and weight that the diameter shall be an exact decimal fraction of a given unit of measurement, whilst the weight of the coin is at the same time an exact decimal fraction of a given unit or standard of weight (say the pound avoirdupois), and the value of the coin itself is also an exact decimal fraction of a given unit or standard of value (say the pound sterling or sovereign).

By these means a perfect, uniform, and combined system of decimal coinage, weight, and measurement is obtained, whereby all commercial transactions would be greatly facilitated.

A.D. 1874, February 20.—No. 649.

BAGEAU, Henry Louis, of Paris, Rue Bichat, No. 33, manufacturer.—" An improved waterproof compound for sizing and coating leather, wood, cloths, or other articles."

This compound consists of india rubber, gutta percha, resin, white lead, and essence.

A.D. 1874, February 20.—No. 650.

CLEGG, Edward Alford, of Shore Mills, Littleborough, in the county of Lancaster, manufacturer, and **HOYLE, Abraham**, of the same place, manager.—" Certain improvements in looms for weaving."

Our improvements consist in applying a pair of compressing rollers to act upon the fabric when woven, which rollers are placed in any convenient position between the fell of the fabric and the cloth beam.

A.D. 1874, February 20.—No. 651.

COLLINS, Charles William, of the city of Manchester, in the county of Lancaster, engineer.—"Improved arrangements and combinations of mechanism for working the slide valves of steam engines and "other motors."

This invention relates to the ordinary slide valves used for regulating the ingress and egress of steam or other power, and also to all valves having a to and fro traversing motion imparted to them; and consists in the employment of toothed sun and planet wheels in connection with connecting rods worked by cranks, arms, or levers; the planet wheel in each case being connected by a crank or eccentric to rods and levers connected to the slide valve.

A.D. 1874, February 20.—No. 652.

STENHOUSE, John, of Rodney Street, Pentonville, in the county of Middlesex, analytical chemist.—"Improvements in the manufacture of sugar, and in purifying saccharine solutions."

The essential feature of this invention consists in effecting the removal of lime, existing either as saccharate of lime or otherwise, from solutions of sugar or other saccharine solutions, by means of oxalic acid, or by means of the oxalates of ammonia, potash, or soda, or mixtures of the same.

A.D. 1874, February 20.—No. 653.

SCOTT, Henry Young Darracott, of Ealing, in the county of Middlesex, Major General, C.B.—"Improvements in the treatment of sewage, and in the manufacture of manures therefrom."

The object of this invention is the preparation, from the sewage of towns by cleanly and inoffensive processes, of manures suitable to the wants of the farmer as respects their richness in fertilizing elements, and also their price and quality.

A.D. 1874, February 20.—No. 654.

NITZKE, Adolph, of Spandau, in the Kingdom of Prussia, but now residing at Birmingham, in the county of Warwick.—"Improvements in cartridges."

To obviate a defect in the present construction of cartridges I thicken or deepen the head of the case and place the inner end of the powder space or room somewhat in advance of the flange, so that should a fracture occur it must take place well in the bore of the gun, and there will be no (or at any rate very little) escape of gas or flame from the breech of the arm.

A.D. 1874, February 20.—No. 655.

FARMER, James, of Salford, in the county of Lancaster, machine maker.—"Improvements in machines "for finishing printed sheets of paper."

This invention relates to improvements upon machines for which Patents were granted to James Morris, dated May 27th 1868, No. 1766, and 1872, No. 1728.

A.D. 1874, February 20.—No. 656.

ROBINSON, John, of Rochdale, in the county of Lancaster, engineer, and SMITH, John, of the same place, engineer.—"Improvements in machinery for shaping wood."

This invention consists in the employment of a rotatory cutter adapted to jointed arms, so that it may be moved into any required position.

A.D. 1874, February 21.—No. 657.

DUNLOP, Andrew, of the city of Glasgow, in the county of Lanark, North Britain.—"Improvements "in endless or portable railways and wheels, for facilitating the traction or draught of vehicles."

This invention consists generally of improved constructions and arrangements of traction and rolling and bearing wheels of traction and other vehicles, and of endless portable rails composed of eight or more links, surrounding and carried by these wheels which roll on them; and laying them down and lifting them as the wheels and vehicles proceed forwards or backwards; and also in improved constructions of the joints of these links and the resting "chairs" or "feet," secured one below each joint, all collectively and respectively as follows: being also partly improvements upon the petitioner's former invention for which Royal Letters

Patent were granted to him, dated 10th May 1861 and numbered 1187, and described in the Final Specification thereof, first, as regards the application to traction engines, a narrow central traction wheel is placed between two rolling and bearing wheels with flanges, carrying the endless chain of eight or more links forming the rails, by arms of a curved tooth-like shape at the point projecting from the middle of the periphery of the said traction wheel; one of these teeth enters a V shaped recess in the middle and upper side of each link and the whole width laterally between the two deep plates forming the two sides of each link, to allow this retaining and traction tooth considerable freedom to move laterally when the vehicle and wheels are turning curves or raised higher at one side than the other, but connected by a loose steel pin passed across the recess through a hole in the tooth with a spiral spring on each side of it which brings the rail back to its normal or central position as soon as the angular strain is removed; and so that the ends of this pin also move freely radially and circumferentially within the traction recess below narrow longitudinal ribs or feathers at the upper inner edges, which retain each link or rail on its acting tooth, while it recedes from the wheel in lifting and laying it down, and yet allows the tooth while passing over the rail to nearly fill the V recess longitudinally to give a positive tractional action with little or no slip. The side of the links of the chains are kept the full parallel width throughout except at their ends where they are jointed to each other, where they are either kneed in and forward at one end to enter the wide end of each adjacent link, or each alternate link is so kneed at both ends to enter and be jointed to its alternate links made with both their ends wide for the like purpose to receive them. The extreme ends of both set of links are rounded, and they are jointed by a round steel pin passed through a round hole in the outer wide jaws, with a retaining cap screwed on each side, and a wide slotted hole in the inner narrow jaws of the links, the latter fitted with an upper sliding bush, fitting the joint pin below and the flat bearing surface of the slot above, to sustain the strain without play or motion vertically, but allowing play and motion longitudinally and laterally for the angular action of the rails when the vehicle is turning curves. Space is left between the inner jaws of each link joint to receive the upper eye of a resting "foot or "chair" for the rails, and through which the joint pin by one arrangement passes direct and sustains the whole pressure and weight at each jointed end of the rails. The lower part of the upper piece of each foot is formed with a broad longitudinal segmental flange which is secured to a corresponding hollow sole piece or shoe, with one or more broad layers of vulcanised india rubber or other elastic material between them by screws and a longitudinal bar passed through an opening between the limbs or webs connecting the swivelling and sustaining eye and the segmental flange, having a short central vertical pin inserted below this bar, through the flange india rubber, and some distance into the upper side of the shoe, to retain these parts all in central position to each other; and the sides of the shoe are carried up and bulge out longitudinally, and are bevelled up vertically in a boat-like shape to the same height, the ends of the segment which is about one third of a circle from the centre of the pin joint supporting it. And the breadth of the rolling or bearing segmental shoe on the ground is preferred to be rather less than the rail above it. A slightly different construction of each "foot" or "chair" consists in forming the lower boat-shaped bearing shoe part and top eye between the jaws or joints of the rails all in one, but making the eye large with an internal cylindrical bush, both having a flat bearing part on top, but with an annular space between them below that filled with one or more layers of vulcanised india rubber or other elastic material, the side of the eye and ends of the jaws would be bevelled off so as to allow the rails to bend or angle on the slotted holes of the inner jaws when the wheels and vehicles were turning bends or curves. When these improved rails are not required for traction but only for the wheels bearing and rolling on, one set of parallel acting guide arms may be used on a loose boss in the centre between the rolling wheels same as described in the Final Specification of the said former Patent before mentioned with their arms connecting to each side of the centre of the rails, instead of the traction wheel with projecting arms or teeth herein-before described.

A.D. 1874, February 21.—No. 658.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Augustin Harmignies, engineer, of Paris, in the Republic of France.*)—"Improvements in "steam engines."

This invention relates to apparatus to be applied to locomotive and other steam engines for the purpose of preventing the suction of air through the blast pipe or pipes when the engine is reversed; and consists in closing such blast pipe or pipes by means of a slide or damper provided with a spring valve, which slide or damper is brought into action when desired by the motion of a lever or otherwise so as to admit of the escape of any excess of pressure which may occur underneath it whilst at the same time excluding air.

A cock for the supply of cold water to the pipe or pipes is provided in combination with this apparatus, such cock being operated automatically through a rod or otherwise by the lever or other means employed for adjusting the position of the slide or damper.

A.D. 1874, February 21.—No. 659.

WISE, WILLIAM LLOYD, of Chandos Chambers, Buckingham Street, Adelphi, in the county of Middlesex, patent agent.—(*A communication from Francis Cowell Pratt and Frederick Parsons, both of Moscow, Russia, engineers*).—"Improvements in the manufacture of wheels for railway rolling stock."

This invention relates to wheels in which the tire is made at one side of its inner periphery with an inside flange recessed so that a projecting part shall overlap the inner periphery of the rim or felloe, the other side of the tyre being formed with an annular recess in its lateral face to receive one flange of a doubly flanged ring, whose other flange overlaps the other side of the inner periphery of the wheel rim.

Also to wheels in which curved plates or washers formed with flanges are substituted for the flanged ring above mentioned.

Also to wheels wherein separate ring plates or washers are dispensed with by forming the heads of the rivets with flanges, like the separate plates or washers already mentioned.

Also to wheels in which the tyre has no internal flange, but is formed at each side with an annular recess in its lateral face, and at each side is secured and held to the rim or felloe of the wheel body by a ring formed with flanges, like the ring already referred to with reference to previous arrangements.

The improvements have for object to effect the attachment of such tyres to the rims or felloes of the wheels in a cheap and simple manner, and more substantially and effectually than has been effected in practice by methods heretofore proposed.

The purposes of this invention are effected by expanding the tyre formed as described evenly throughout in a bath of boiling water, and afterwards when such tyre has been shrunk on to the rim or felloe, securing it (the tyre) and the parts adjacent to it in their proper relative positions on the rim or felloe of the wheel body, by rivets peculiarly disposed and arranged, whereby the weakening of the tyre and of the rim or felloe is practically obviated, and the tyre is rendered capable of being readily removed and refixed as may from time to time be necessary, without injury to itself or to the rim or felloe.

A.D. 1874, February 21.—No. 660.

BREWER, EDWARD GRIFFITH, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from E. J. Weedermann and Sons, of Flensborg, Prussia.*)—"Improvements in the construction of 'ice breaker' ships; and in screw propellers for the same and for other ships."

The weight of ship is caused to break the ice. According to one arrangement both ends of ship are alike with water tanks, so that by emptying or filling the same, the one or other end is raised or lowered. Another mode is to make both ends with a sloping keel, the outer ends being just above the water level; the weight of the ship is thus caused to press on and to break through the ice.

Propellers are made without twist, but are flat surfaces at an angle of about 30° to 60° to the axis.

Applicable to all sorts of ships, steam ferries, and vessels.

A.D. 1874, February 21.—No. 661.

BREWER, EDWARD GRIFFITH, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from E. Diderichsen, of Copenhagen, in the Kingdom of Denmark.*)—"Improvements in the manufacture of artificial butter."

This consists in making butter from tallow or other fatty matter. It is washed in cold water, cut into pieces, and melted by steam in a wood vessel. Acid soda is subsequently added, and the material boiled several times, adding soda, and finally in pure water; then sifted through flannel and afterwards churned; fine oil and sour milk being added during the latter process.

A.D. 1874, February 21.—No. 662.

WEST, DANIEL KEMP, of Crown Place, Kentish Town, in the county of Middlesex, engineer.—"Improvements in engines to be driven by water and steam, and in pumps."

A number of cylinders arranged with their axes parallel to each other contain pistons which are caused to act successively on the surface of a conical disc working on a corresponding inverted fixed cone, and thereby to impart to the disc a rolling motion, which is communicated through an arm or arms to the crank.

The pistons may be worked by means of an ordinary slide valve driven from the shaft, or a rotary valve or valves worked from the disc.

A.D. 1874, February 21.—No. 663.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from La Société Marrel Brothers, of Rive de Gier, in the Republic of France.*)—" Improvements in " the construction and manufacture of armour plates."

This invention relates to an improved mode of constructing and manufacturing armour plates for protecting ships, forts, batteries, and for other like purposes, whereby considerable strength and invulnerability are imparted to the interior of the plates, whilst at the same time the malleability and tenacity of their external surface are preserved, and increased facility is afforded for welding; and consists in forming such plates of bars composed of a centre or core of steel, cast metal, or other suitable hard metal or alloy, surrounded by a sheath or casing of wrought iron or other suitable malleable metal.

A.D. 1874, February 21.—No. 664.

HIPKINS, Daniel, of Tipton, in the county of Stafford, provision merchant.—" Improvements in the " manufacture of artificial butter."

This invention refers to a method of manufacturing artificial butter from the fat of beef, mutton, or pork, by which method the fat is freed from organic impurities, and the artificial butter so produced possesses the cool smoothness on the palate peculiar to butter and also to a great degree its flavour.

A.D. 1874, February 21.—No. 665.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 23, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from Messieurs F. Klein and Company, of Leignitz, Silesia, in the Kingdom of Prussia.*)—" Improvements in machinery employed in the manufacture of felt " hats."

The invention consists in the arrangement of a number of cones, by means of which the bodies or hats are completely "planked" without the necessity for finishing them afterwards by hand, whilst the bodies or hats are in the process of "planking" produced and retained in the correct conical shape.

A.D. 1874, February 21.—No. 666.

ARMSTRONG, Frank, of Waterbury, Connecticut, United States of America, now of 8, Southampton Buildings, London.—" An improved clasping pin for securing articles of dress and for other like purposes."

My invention relates to a simple and convenient device for fastening and holding up the skirts of ladies' dresses, for fastening shawls and various other articles of wearing apparel, for securing anti-nacassers upon chairs, and for other like purposes.

A.D. 1874, February 21.—No. 667.

MUNTZ, Philip Albert, of Keresley, in the county of Warwick, gentleman, and **SHARP, Thomas Budworth**, of the French Walls Works, Smethwick, in the county of Stafford, mechanical engineer.— " Improvements in the process of and apparatus for condensing and collecting the fumes evolved by fur- " naces used for melting metals and for other metallurgical operations."

According to this invention the zinc or other fumes are conducted into a vertical flue in connection with the chimney stack of the furnace, and from thence to a condensing chamber or vessel. The damper of the chimney stack has a sand valve, and in the vertical flue described is a steam jet and also a perforated ring or rose. Cold water in a thin sheet or in a finely divided state passes by the said ring or rose into the vertical flue, and by the condensation of the steam of the steam jet not only aids in increasing the draught but also condenses and collects a considerable quantity of the fumes or condensible matter drawn from the furnace. The fumes from the vertical flue are conducted or drawn into a closed condensing chamber partly filled with water, the fumes either passing under a perforated diaphragm or under inclined shelves or divisions in a tortuous or zig-zag path. The suspended and condensible matter is wholly or mainly retained by the water, while the gaseous matter escapes by a pipe opening into the upper part of the chamber. The fumes before they pass into the condensing chamber may be conducted through the flue of a steam boiler nd thereby partly cooled.

A.D. 1874, February 21.—No. 668.

JONES, Edward Fiddian, of Birmingham, in the county of Warwick, brass founder and lamp manufacturer.—“ Improvements in railway, ship, and other lamps.”

This invention consists of the following improvements in those parts of railway, ship, and other lamps which provide for the ingress of cold air and the egress of heated air. The cold air is supplied to the lamp by an air chamber or channel in the upper part of the interior of the lamp case. External air enters this chamber through perforations in the case of the lamp, and descending in the said chamber enters the lamp case through the wire gauze bottom of the chamber. The heated air escapes from the lamp through a perforated cap or screen over the opening to the head and in the inner tube of the head. By means of a disc or plate supported under the opening to the head, and forming a double top to the lamp, currents of air entering the lamp by the head, are prevented from passing down the chimney of the lamp.

By these improvements the flame of the lamp is effectually protected from wind or currents of air, and the flickering or unsteadiness of the flame is prevented.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 15 to August 21, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, February 23.—No. 670.

ELDER, George Fyfe, of Lochee, in the county of Forfar, North Britain, managing engineer of the Camperdown Linen Works.—"Improvements in crisping or doubling textile and other fabrics, and in the machinery or apparatus employed therefor."

The features of novelty which constitute this invention are—

First. The curviform saddle.

Second. The roller and strap in the saddle for controlling the position of the cloth.

Third. The inclined or angular bars.

A.D. 1874, February 23.—No. 671.

LAIRD, John, the younger, of the firm of William Laird and Company, manufacturers, and **RUTHERFORD**, William, manager to the said firm, both of the town and county of Forfar, North Britain.—"Improvements in weaving bags, sacks, and other tubular and double fabrics, also single fabrics, and in the means employed therefor,"

The features of novelty which constitute this invention are—

The improvements in the "Dobbie" machine, whereby its duplex action is obtained.

A.D. 1874, February 23.—No. 672.

WILKE, Henry, of 3, Crown Villas, Greengate Street, Plaistow, in the county of Essex, engineer.—"Improvements in steam-boilers."

Inclined water tubes below a main or tubular boiler and through furnace and combustion chamber, with "up" tubes rising (from the inclined tubes) in and through the said chamber. Steam spaces in the "up" tubes in communication with each other, and with steam space of boiler. Water tubes in communication with water space of boiler. Furnace bricked over, so that within its length flame cannot play on shell of main boiler. Sides of furnace and sides, top, and back of combustion chamber formed of iron cased with fire bricks, or otherwise wholly or partly of water chambers, which may be used as feed heaters open to the atmosphere, or closed and a safety valve applied. Other valves as required.

A.D. 1874, February 23.—No. 674.

JOHNSON, Job, of Brooklyn, in the county of Kings, and state of New York, United States of America. —"Improvements in ball casters."

At the bottom of the socket in which the ball turns is a hardened steel plate, and the ball is retained by a sleeve screwed upon the outside and interlocked to prevent unscrewing.

Intermediate balls when used between the main ball and steel plate are retained by a steadying disk.

A.D. 1874, February 23.—No. 678.

BARLOW, Henry Bernoulli, of Manchester, in the county of Lancaster, patent agent.—(*A communication from Nicolas Joseph Galland, of Paris, France, engineer*).—"Improvements in brewing, and in the machinery or apparatus employed therein."

The nature of this invention consists in a complete system of brewing, in which the various processes are performed in succession and in vacuum, and by means of recuperative heating apparatus, which effects a great saving in fuel and reduces the time required for performing the various operations. The invention consists,—

First, in the apparatus to wash the barley.
Secondly, the arrangement of malt kiln turrets.
Thirdly, the apparatus for washing and grinding malt.
Fourthly, the apparatus for saccharifying malt in vacuum.
Fifthly, the peculiar construction of a filter press.
Sixthly, the apparatus for boiling the wort and for applying the hops.
Seventhly, an apparatus for cooling wort, and
Eighthly, the arrangement of the recuperators of heat.

A.D. 1874, March 2.—No. 757.

GOTTHEIL, Robert, of the International Patent Office, 126, Linden Str., Berlin, Prussia, civil engineer. —(*A communication from John Schmitt, a person residing at Coblenz, in the Kingdom of Prussia, engineer.*) —"Improvements in knitting machines."

According to this invention two needles situated at an angle to each other are bent into a helical or corkscrew form at one end, so that on rotating the one needle the meshes of the fabric are made to travel along its helices towards the free end thereof, from which they are eventually delivered. On such free end is formed a notch, on which the loop for the next row of meshes is looped, so that as the needle revolves it draws such loop through the mesh about to be delivered from it, and this loop is then taken up by the free end of the second needle and is transferred to its helices. Thus the new meshes consecutively formed on the second needle are made to travel along its helices on to the straight part thereof, whence they are conveyed along a wire connecting the straight parts of both needles back to the first needle, in order to repeat the above-described operation. The helical parts of the needles are carried in bushes fixed to a framing, such bushes allowing the needles to revolve, but preventing any end motion. The needles are rotated by bevil gearing having cylindrical bosses with studs entering holes in the helices of the needles.

A.D. 1874, March 2.—No. 761.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Dawson Miles, of Boston, state of Massachusetts, United States of America.*)—"Improvements in preserving eggs."

This invention relates to an improved mode of preserving eggs, and consists in effecting their condensation by evaporating to a semi liquid mass, after removing them from the shells, the degree of heat employed being so low as not to prevent them from being afterwards dissolved when required for use; and in the employment of sugar, salt, and sulphite of soda in combination with the eggs.

A.D. 1874, March 10.—No. 869.

IBBOTSON, Herbert, of Hollins Mill, near Sheffield, in the county of York. — "Improvements in machinery for grinding corn."

This invention relates to improvements in adjusting and regulating the top stone of mills used for grinding corn and other grain, and consists in placing between the end of the lever carrying the footstep and shaft of the top stone and the adjusting screw of the same a spring of such a strength that it will keep up the weight of the top stone when partially closed, the effect being a certain amount of self adjustment in the distance between the top and bottom stones, and also a peculiar giving or yielding motion to the top stone, so that the flour is not crushed to a damaging extent.

A.D. 1874, August 15.—No. 2819.

STEARNS, Zenus Barnum, of Richmond, Virginia, United States of America, but temporarily of 4, South Street, Finsbury, in the county of Middlesex.—(*A communication from Henri Gauchot, of Paris, in the Republic of France.*)—"Improvements in machinery for the manufacture of boxes for containing matches and for other articles."

The features of novelty claimed are—

Firstly. The general arrangement and construction of the crank arms and connecting rods for obtaining the various movements of the machine.

Secondly. The means for folding down the last fold for forming the box, and by which boxes free from soil are obtained.

Thirdly. The employment of a carriage for regulating the supply of paste.

Fourthly. The mechanical means for roughing the bottoms of match boxes.

Fifthly. The arrangement of mechanism for taking up the sheets of cardboard.

Sixthly. The automatic distribution of the mandrils and the detaching therefrom of the boxes.

Seventhly. The means for facilitating the removal of the cover.

A.D. 1874, August 21.—No. 2874.

GREGG, Washington Parker, of Boston, in the state of Massachusetts, of the United States of America.—"Improvements in roller skates and which he terms improved wheel skates."

The principal object of this invention is to provide skates with their wheels arranged in certain novel ways in respect to each other and the stock, for diversified exercises and effects by experts and athletes, as well as for roller skaters in general upon all suitable surfaces.

The first part of the invention provides for two driving wheels, each outside of the stock, on an axle suspended under the arch of the instep, in brackets, depending from the lower side of the stock or foot-rest, so that the upper parts of the peripheries of said wheels may be on a plane lower than the upper surface of the stock (as such peripheries cannot be on such lower plane to much if any practical advantage or effect, when on an axle through the stock), in combination with one smaller roller under the toe, and another under the heel; and also when desired, so that by increasing the depth of the brackets, the upper parts of the peripheries of the two outside driving wheels may extend above the plane of the upper surface of the stock, in combination with one such smaller roller under the toe and another under the heel; and larger rollers be employed when preferred under the ends of the stock, in combination with the said outside wheels, than could be used with two driving wheels, equal in diameter to the said outside wheels, and having their axles through the stock. The smaller outside drivers may be first practised upon, and afterwards the larger in combination with the heel and toe supporting wheels.

The second part of this invention provides for two outside driving wheels, one at each side of the ball, with two other outside driving wheels, one at each side of the front of the heel of the stock, for increased support on each side and overcoming obstacles; and also provides for one outside driving wheel at each side of the front of the heel, with two other smaller side wheels, one under each side of the ball of the stock. When it is desirable to have some of these wheels lighter than the others and to vary effects, whether said sets of four side wheels be in combination or not, with one small supporting roller partially under the heel and another partially under the toe. The two outside wheels at the rear may be equal in diameter to the two outside wheels at the front of the stock; but in general and with a view to easier turning it is designed that said two at the rear should differ in diameter from the two at the front.

The third part of the invention provides for two outside driving wheels, one at or near the middle of each side of the stock, in combination with two smaller rollers partially under the toe and two partially under the heel for double support at the toe and heel when requisite; and whenever it is desirable to vary the positions, it provides for two such outside driving wheels in combination with two such small wheels under the front of the ball and two partially under the heel, or with two under the front of the ball and two under the rear of the front of the heel, or for shorter skates with two under the heel and one under the toe.

Axle holding devices are provided when desired for more than one set of two outside driving wheels, each set differing in diameter from the other set or sets, to be used each set by itself without the other sets, on one and the same stock, in combination with the small rollers under the stock in the different positions provided for them as above set forth.

The combinations of outside drivers with smaller rollers partially under the heel and toe are designed more for beginners and roller skaters in general. The other combinations more for experts and athletes. In the former combinations it is preferred that the bearing surfaces of the drivers be lower than those of said smaller rollers. In the different combinations mentioned some of the axles of the outside wheels may be above, some below, and others through the stock, according to the diameter of the wheels.

The stocks or foot rests, wheels, axles, and other parts may be of any materials, size, or description, suitable for roller skating, and said wheels and other parts may be fitted to the foot-rest and fastened on by any convenient known means. But all the parts should be as light as consistent with strength and durability, with a view to facility of movement, speed, and safety.

A.D. 1874, August 21.—No. 2875.

MORGAN-BROWN, WILLIAM, of the firm of Brandon and Morgan Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Joseph Henry Osgood, of Boston, Massachusetts, United States of America*).—"An improved composition for printers' " inking rollers and other purposes, and the process of making the same."

This invention describes a method of making the improved composition for printers' rollers entirely in the first instance without heat, the other materials added entirely combining with the glue base by means of absorption.

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[*Mackenzie, G. N.* (Benson), 64, Metallurgical
[furnaces.
——— *P. E., Rehbein, W. G., & Roberts, H.* (Benson),
[495, Welding copper.
Brook, E., & Wilson, A., 427, Consuming fuel in furnaces.
Brookes, W. H., 84, Pumps.
Brooks, F. W. (Everett), 500, Liquid meters.
Brooks, W., 727 (*App.* 35.) Fringing fabrics.
Broux, A. & D. (Bonneville), 644, Axle sockets.
———, *D.* (Bonneville), 1230 (*App.* 41.) Lubricating
[spindles.
——— *D. & A.* (Bonneville), 644, Axle sockets.
Brown, A., 307, Dredgers.
Brown, D., & Fulton, J. (Haseltine), 1054 (*App.* 39.)
[Sheep shears.
——— *E.* (Lake), 1421 (*App.* 4.) Rotating shaft indicators.
——— *J. R.* (Miller), 98, Treating fatty matters.
Brown, W. Morgan- (*Keniston*), 5, Boot and shoe fastenings.
——— (*Gardner & Pocock*), 450, Boots.
——— (*Osgood*), 2875 (*App.* 8.) Composition
[for printers' rollers, &c.
Browne, A. (*Knapp*), 66, Raising sunken vessels.
Browne, A. (*Foundries & Forges Co.*), 220, Iron and steel.
——— (*Foundries and Forges Co.*), 422, Alloys of iron.
——— (*Guyer*), 2801 (*App.* 7.) Bolt and nut lock.
——— R. J., 816 (*App.* 6.) Obtaining motive-power.
Buchholz, G. A., 17, Obtaining motive-power.
Buckingham, W., 551, Heating buildings and steam-boilers.
Bucknall, F., 362, Digging roots and cultivating land.
Budenberg, A. (*Schäffer & Budenberg*), 327, Injectors.
Budenberg, C. F., & Schäffer, A. (Budenberg), 327,
[Injectors.
Bull, W., 1625 (*App.* 7.) Hand dredger or excavator.
Bullough, J., 177, Sizing and drying yarn.
Burgess, C. T. & W. J., 183, Reaping and mowing machines.
——— W. J. & C. T., 183, Reaping and mowing machines.
Burley, W., & Howes, W., 303, Carriage lamps.
Burman, A. R., & De Frece, M., 575, Perfume sprayers.
Burns, J., & Higgins, C. S. & W. B. (Bonneville), 1271
[(*App.* 42.) Water-closets.
Burton, C. C., 338, Wheels for traction engines.
Buss, W., & Maplesden, J., 361, Ploughs.
Butterworth, E., 228, Spinning fibrous substances.
Bywater, W., & Smith, S., 646, Spinning, &c. fibres.

C.

Caffall, R. M., & Thomas, A., 467, Sealing gas mains, &c.
Cain, T., 86, Hollow fire-bars.
Callender, J. A., 462, Railway signals.
Cambon & Co. (Johnson), 18, Preserving fabrics, wood, &c.
Camp, A. van, & Clark, G., 33, Pavements.
Campbell, J., & Somerville, W. C., 538, Mortar mills.
Campion, G., 498, Harrows, &c.
Cannon, T., 330, Glue.
Capon, L. J. B. (Lacaze), 287, Looms.
Casement, D. T. (Clark), 69, Combustion of fuel, &c.
——— (Clark), 70, Regulating pressure of fluids.
——— (Clark), 351, Combustion of fuel.
Cathro, J. J., Girvan, J., & Lecerf, H., 394, Ornamenting
[paper.
Cattanach, D. D. (Lake), 423, Gum, &c.
Chalk, W. H., & Chubb, G. H., 320, Safes and doors.
Chalumet, G. (Mewburn), 156, Textile fabrics.
Chamberlin, W. R. B., 54, Electro-motive-power.
Chandler, S., & Hulett, D., 1287 (*App.* 42.) Gas.
Chapin, E. P. (Condit), 316, Weaving ribbons, &c.
Chapman, G., 38, Sesqui-carbonate of ammonia.
Charles, P., 353, Controlling supply of water.
Chatwin, H., 504, Finger boards of pianofortes, &c.
Cherry, H., 404, Steam pumps.
Chiozza, L. (Clark), 480, Treating maize.
Chippindale, I., 318, Sifting cinders.
Chubb, G. H., & Chalk, W. H., 320, Safes and doors.
Clark, A. M. (*Casement*), 69, Combustion of fuel, &c.
——— (*Casement*), 70, Regulating pressure of fluids.
——— (*Rogers*), 208, Lamp black.
——— (*Sawyer*), 253, Electric telegraphs.
——— (*Morton*), 290, Propelling vessels.
——— (*La Grove*), 292, Mechanical toy.
——— (*Pelouze & Audouin*), 322, Gas-purifying.
——— (*Ligny*), 323, Drying and heating.
——— (*Allin*), 350 Cutting and screwing pipes.
——— (*Casement*), 351, Combustion of fuel.
——— (*Tracy & Lawton*), 363 Sewing-machine cabinets.
——— (*Goodwin*), 364, Cutting button holes.
——— (*Gschwind & Beberdick*), 421, Mouldings.
——— (*McKinley*), 438, Hoeing, &c.
——— (*Chiozza*), 480, Treating maize.
——— (*Robert*), 547, Clocks.
——— (*Davies*), 952 (*App.* 38.) Signal lanterns.

: (*Cook*), 1019 (*App.* 39.) Preparing grain for flour.
- (*Doremus*), 1410 (*App.* 43.) Springs.
- (*Bliss*), 2366 (*App.* 2.) Making soap bubbles.
- (*Universal Signal Light Co.*), 2390 (*App.* 2.)
[Signal lanterns.
- (*Miltimore, Phillips & Morris*) 2498 (*App.* 3.)
[Railway carriage axles.
- (*Atkinson*), 2563 (*App.* 4.) Steam pumps.
- E. P., 49, Teaching military drill.
- G., & Van Camp, A., 33, Pavements.
- J., 204, Waterproof garments.
- J. L., & Standfield, J., 111, Docks and pontoons.
- J. L., & Standfield, J., 202, Docks and pontoons.
- J. L., & Hill, E. J., 564, Railway signalling.
- W. (*Cosby*), 579, Invalid bedsteads.
- (*Lo Forte & Quintaralle*), 593, Ships.
ke, A. B., 631, Washing machines.
—, H., 818 (*App.* 36.) Combination locks.
on, R. H, Harrison, J., & Loynd, W., 537, Air
[Pumps.
g, E. A., & Hoyle, A., 650, Looms.
- J., & Taylor, R., 555, Mules and twiners.
- T., & Lucas, T., 623, Carding engines.
E., & *Vose*, *R.* (Lake), 2712 (*App.* 6.) Elliptic
[springs.
ray, T., 2372 (*App.* 2.) Separating stony substances
[from foreign beans and wheat.
, P., jun., 469, Re-winding yarn or thread.
erham, H., 309, Stripe motion of looms.
ey, F. C., & H., 624, Furnace doors.
— H., & F. C., 624, Furnace doors.
ings, J. S. (*Reynolds*), 154, Snaps or connectors.
é, S., 37, Composition for bearings.
, J. H., 142, Railway couplings.
F., 181, Crushing and reducing baryta, cocoa, &c.
ott, *J.* (Adams), 333, Kaleidoscopes.
ott, J., 2476 (*App.* 3.) Tube scrapers.
gridge, A. (*Folliet & Gally*), 374, Axle boxes.
s, C. W., 651, Working slide valves.
t, F. (*Chapin*), 316, Weaving ribbons, &c.
in, *G.* (Lippincott), 237, Condensed milk.
r, C. C., 612, Preparing yarns and fibres.
O. F. (Clark), 1019 (*App.* 39.) Preparing grain
[for flour.
er, C., 417, Working railway points.
E., & *Maxwell*, *J. R.* (Benson), 1086 (*App.* 40.)
[Steam-engines.
n, W., 402, Construction of ships.
ng, R., & Walworth, J., 2067 (*App.* 51.) Preparing
[wheat for grinding.
tt, A. F., 568, Artificial fuel.
s, *B.*, *Suarès*, *S. L.*, & *Fonsèque*, *D. F.* (Espir),
[510, Cutting down trees.
an, J. F. (*Archbald*), 87, Manures.
ly, *E.* (Gedge), 107, Embroidering machines.
, C. W., 141, Construction of concrete buildings.
, *O. G.* (Clark), 579, Invalid bedsteads.
, W., 1, Combined folding bedstead and air bed.
gham, *G. W.* (Lake), 1730 (*App.* 46.) Ironing
[machines.
S. G., 520, Pills.
W., 115, Sacks or bags.
, C. C., 407, Tramway apparatus.
- C. C., 491, Tramways.
, J., & Derihon, J. (*Reintjens*), 529, Non-conducting
[mastic.
ie, G., & Somerville, G., 365, Cutting paper, &c.
nd, J. S., 151, Economizing fuel, &c. in furnaces.
ill, T. A., & Marshall, W., 118, Wringing and
[mangling.
ll, *J. H.* (Haseltine), 2291 (*App.* 1.) Weavers'
[harness.
shank, A. B., 89, Cleats for sailing boats.

Cunningham, D., & Douglas, A., 336, Scotch bonnets.
Curtis, F. (*Williams & Page*), 24, Lamps.
——— W. J., 502, Railway points.

D.

Daddow, S. H., 1558 (*App.* 45.) Fuses for mining and
[blasting.
Daimler, *G. W.* (Abel), 414, Gas motor engines.
——— (Abel), 605, Gas motor engines.
Dalzell, J. B., 560, Signalling on railways.
Dàmkoehler, *J. A. H.* (Tongue), 505, Preserving meat.
Danet, G. A., & Feuillant, X. C. E., 1007 (*App.* 39.)
[Preserving food.
Dann, J. T. (*Gervais*), 530, Cooking utensils.
Dargue, W., & Ellison, G., 590, Railway signalling and
[breaks.
David, *A.* (Ray), 100, Producing optical illusions.
Davies, D., 88, Steam-boilers.
——— 104, Governors of steam-engines.
——— H. D., 400, Roads and roadways.
——— I., 413, Separating "black plate."
Davies, *T. A.* (Clark), 952 (*App.* 38.) Signal lanterns.
Davies, W. H., & Higgins, F. H. W., 640, Telegraph
[signals, &c.
Daville, R. S. (*Webster & Webster*), 2647 (*App.* 5.)
[Sewing machines.
Davis, J. W., & Strauss, L., 2560 (*App.* 4.), Fastening
[pockets.
Dawson, D., & Slater, C., 633, Dyeing.
———, T. G., & J., 1845 (*App.* 48.) Printing.
——— J., & T. G., 1845 (*App.* 48.) Printing.
Deacon, H., 163, Treating substances employed in effect-
[ing chemical decomposition of gases.
Dean, *S.*, *Smith*, *W. H.*, & *Merrell*, *H.* (Haseltine), 2001
[(*App.* 50.) Millstones.
Dearman, R., 397, Saving fuel and consuming smoke.
De Fever, C., 209, Sowing and planting.
De Frece, M., & Burman, A. R., 575, Perfume sprayers.
De Fresne, *E. L. J. E.* (Bousfield), 2388 (*App.* 2.) Pro-
[pelling ships.
Deiss, A. A., 147, Extracting quinine from bark.
De la Bastie, F. B. A. R., 2783 (*App.* 7.) Tempering glass.
Delalot, S. L., 302, White metal.
De la Rue, W. W., & Shaw, W. T., 311, Date indicators.
Delavigne, N. A., 56, Corkscrews.
Deléon, J., 525, Building materials, &c.
De Louvagny, Comte de Beaurepaire, 591, Alcohol.
De Mestre, *A.* (Bonneville), 683 (*App.* 35.) Wiring
[bottles.
Dennis, T. H. P., 431, Water waste preventors.
Deny, L., 16, Perforating metal plates.
Derihon, J., & Craps, J. (*Reintjens*), 529, Non-conducting
[mastic.
Derry, J. D., 135, Lamp and candle holders.
Dethiou, L. H., 542, Buckles.
Devlan, *P. S.* (Bonneville), 767 (*App.* 36.) Packing
[journal boxes.
De Vogt, H. C., 81, Navigating the air.
De Weerd, R. van, 245, Producing motive power.
Dewynter, C. (*Lenoir*), 430, Purifying gas.
De Zuccato, E., 1078 (*App.* 40.) Producing fac-similes
[of writings, &c.
Diderichsen, *E.* (Brewer), 661, Artificial butter.
Dix, A. M., 582, Propelling vehicles.
Dobson, *James & John* (Barlow), 11, Carding wool.
——— *John & James* (Barlow), 11, Carding wool.
Donisthorpe, A. R. & G. E., White, G., & Toon, J., 171,
[Woollen yarns.
——— G. E. & A. R., White, G., & Toon, J., 171,
[Making woollen yarns.

Doremus, W. T. (Clark), 1410 (*App.* 43.) Springs.
Douglas, A., & Cunningham, D., 336, Scotch bonnets.
Drechsler, F. J., 133, Winnowing machines.
Dryden, J. A., & Tandy, G. G., 347, Lamps.
Dubois, E. A. (Vaughan), 246, Air-gas.
Duckett, G., & Mercer, T., 4, Size.
Dudgeon, A., 20, Utilizing heat of furnaces.
——— 22, Peat-fuel.
Duncan, J. T. (*Hunt*), 546, Precipitating metallic copper.
Dunlop, A., 657, Endless railways and wheels.
Dunn, W. W., 503, Drilling rock.
Dunning, G., & George, C. B. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.
Dutton, S. T., 230, Railway points.
Duval, J. (Jensen), 13, Fire-arms.
Dyer, E., 328, Fire escapes.
Dyk, H. van, 199, Dressing and travelling bags.
Dyson, G. W., 122, Rolling metals, &c.

E.

Easton, W., & Tattersall, F., 248, Moulding bricks, &c.
Eastwood, D., 186, Looms for weaving.
Edwards, J., 384, Valves.
Edwards, S., & Erichsen, E. J. (Jensen), 138, Vats, [gas-holders, &c.
Egerton, P., 617, Mounting spindles.
Elder, G. F., 670 (*App.* 8.) Doubling fabrics.
——, H., 481, Railway breaks.
Ellis, J. E., & Redgate, E., 172, Treating hides and skins.
Ellison, G., & Dargue, W., 590, Railway signalling and [breaks.
Emsley, S., & Peel, J., 47, Looms.
——— S., & Peel, J., 632, Looms and pickers.
Emslie, J. T., 40, Registering omnibus passengers.
Enoult, A., fils, & Varinet, J. (Abel), 184, Dressing fabrics.
Enterprise Manufacturing Co. (Hunt), 606, Hand grind- [ing mills.
Erichsen E. J., & Edwards, S. (Jensen), 138, Vats, &c.
Espir, C. (*Suarès, Fonsèque & Cordes*), 510, Cutting [down trees.
Essen, W. S. von, 492, Cleaning steam-boiler flues.
Everett, G. A. (*Brooks*), 500, Liquid meters.
Eyre, G., 164, Convertible school desks and seats.
Eyth, M., & Greig, D., 527, Towing machinery.

F.

Fallows, J. T., Marlow, J. B., & Roebuck, J., 274, Rail- [way points.
Fanning, J., & Nugent, E., 191, Screws.
Farmer, J., 655, Finishing printed sheets of paper.
Farquhar, J. F. C., 112, Gas burners.
Ferguson, F. T. (Benson), 426, Pipe tongs and cutters.
Feuillant, X. C. E., & Danet, G. A., 1007 (*App.* 39.) [Preserving food.
Fever, C. de, 209, Sowing and planting.
Finger, L., 298, Electro-magnetic annunciators.
——— 1779 (*App.* 47.) Electro-magnetic annunciators.
Fitzgerald, D. G., & Molloy, B. C., 266, White lead.
Fleming, G. S., 120, Caps for candles when burning.
Floyd, J. R. (Lake), 679 (*App.* 35.) Gas-retort joints.
Folk, J. E., & Wilson, C. F. (Newton), 458, Bolsters [and bearings for spindles.
Folliet, L., & Gally, M. (Collingridge), 374, Axle boxes.
Fonsèque, D. F., Cordes, B., & Suarès, S. L. (Espir), [510, Cutting down trees.
Forbes, G. H., 26, Gas making.
——— 28, Fuel.
——— 34, Cements, plaster and artificial fuel.
——— 231, Purifying gas; artificial fuel.
——— 232, Purifying gas.
Ford, A., 269, Cleansing cotton waste.
—— S., 486, Actuating prime movers.
Forges & Foundries Co. (Browne), 220, Iron and steel.
——————— (Browne), 422, Alloys of iron.
Forte, R. Lo, & Quintaralle, R. (Clark), 593, Ships.
Foster, J., & Whitaker, W., 143, Cleaning reed dents.
Fottrell, J., 77, Artificial stone pipes and tubes.
Foulis, W., 153, Charging retorts.
Foundries & Forges Co. (Browne), 220, Iron and steel.
——————— (Browne), 422, Alloys of iron.
Fowlie, J. F., 2, Harness.
Fox, F. W., 82, Combing fibres.
—— T., 257, Spring mattresses.
Frankenstein, P., 484, Waterproof overcoats.
Frece, M. de, & Burman, A. R., 575, Perfume sprayers.
Fresne, E. L. J. E. de (Bousfield), 2388 (*App.* 2.) Pro- [pelling ships.
Freund, A. L., 607, Cooking apparatus and utensils.
Friedmann, A., 373, Heating boilers of steam ships.
Fulton, J., & Brown, D. (Haseltine), 1054 (*App.* 39.) [Sheep shears.

G.

Gaillard, L. J. P. E. (Touaillon), 519, Stopping teeth.
Galland, N. J. (Barlow), 678 (*App.* 8.) Brewing.
Gally, M., & Folliet, L. (Collingridge), 374, Axle boxes.
Gardner, C. F., & Pocock, E. (Morgan-Brown), 450, Boots.
Garton, W., 508, Treating grains or spent malt.
Gauchot, H. (Stearns), 2819 (*App.* 8.) Match boxes.
Gaylord, E. (Henderson), 2110 (*App.* 51.) Fire-arms.
Gebauer, F., 321, Hydraulic mangles.
Gedge, W. E. (*Bradley Window Co.*), 91, Ventilating [window sash.
—— (*Cornely*), 107, Embroidering machines.
—— (*Renard, fils.*), 130, Steam generators.
—— (*Liotard, jun.*), 242, Gas burners.
George, C. B., & Dunning, G. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.
Gerhard, F. W., 367, Purifying iron ores.
Gervais, A. (Dann) 530, Cooking utensils.
Gibbs, W. A., 50, Drying apparatus.
Gibson, H. W., & Sons (Jensen), 273, Wood working [machinery.
Gibson, W., 435, Furniture castors.
Gilbee, W. A. (*Boëthius*), 354, Cork-cutting machinery.
Gilbert, W., & Leonardt, F., 434, Pen and other boxes.
Gilles, F. G. (Gottheil), 25, Gas engines.
Girvan, J., Cathro, J. J., & *Lecerf, H.*, 394, Ornamenting [paper.
Glover, H., 346, Sulphuric acid.
Goater, J., 552, Fireproof safes.
Gold, R. S., 524, Hats.
Goodwin, C. R. (Clark), 364, Cutting button holes.
Gosselin, L. F., 514, Swimming jackets.
Gottheil, R. (*Oesten*), 6, Measuring heat of fluids in pipes.
———— (*Mehl*), 21, Treating wool.
———— (*Gilles*), 25, Gas engines.
———— (*Lemmens*), 36, Dyeing warps.
———— (*Schmitt*), 757 (*App.* 8.) Knitting machines.
Goulding, W., 405, Furniture, &c.
Gouverneur, J., & Hamilton, J. B., 443, Musical instru- [ments.
Gower, G. G. W. Sutherland-Leveson- (Duke of Suther- [land), 319, Steam cultivators.

, *E.* (Johnson), 2646 (*App.* 5.) Transmitting
[musical tones.
, H. T., & Price, C. W., 29, Railway breaks.
er, H., 268, Glass letters and figures.
wood, A., & Keats, J. & A., 620, Sewing boots, &c.
———, J., & Pooley, H., jun., 126, Weighing ma-
[chines.
, W. P., 2874 (*App.* 8.) Roller skates.
ry, H. S., 571, Seed and manure drills.
— J., & Topping, J., 621, Cutting clay into
[bricks, &c.
, D., & Eyth, M., 527, Towing machinery.
, J. T. (*Austin*), 219, Wrenches.
n, R. A. (Lake), 212, Peat-fuel.
, T., 271, Coupling for driving belts.
hs, G., 602, Sewing-machine shuttles.
m, S. E., & Larer, D. (Haseltine), 1129 (*App.* 40.)
[Millstones.
, *W. A. P. la* (Clark), 292, Mechanical toy.
s, F., & Bramall, S., 83, Railway breaks.
– T. B., 476, Cigarettes and cigars.
nski, F., 281, Mowing machines.
, J., 312, Umbrellas and parasols.
ind, J., & Beberdick, C. (Clark), 421, Mouldings.
J., & Williams, D., 103, Anchors.
ridge, F., & Siddall, J., 243, Oil lamps.
, *I. D.* (Browne), 2801 (*App.* 7.) Bolt and nut lock.

H.

, E. H. (*Lévy*), 301, Gas pressure indicator.
F., 360, Compressed fuel.
, W. B., & Bleasby, A., 556, Furnaces or cupolas.
S., 616, Splitting hides or skins.
J., 468, Treating spent tan, spent hops, &c.
r, W., Bond, J., & Threlfall, R. A., 30, Polishing
[spinning rollers, &c.
ton, J. B., 119, Musical instruments.
——— & Gouverneur, J., 443, Musical instru-
[ments.
m, W., & Smith, A., 562, Preparing peat.
ld, W. H., 310, Capstans and windlasses.
eaves, J., & Robinson, T., 448, Sulphates of soda
[and potassa.
g, G., & Whiteley, W., 244, Looms for weaving.
, B., 541, Earthenware printers' stoves.
gnies, A. (Johnson), 658, Steam-engines.
, J., 951 (*App.* 38.) Steam and air-engines.
gton, J., 44, Locks or fastenings.
— 71, Treating skins or hides.
, *D.* (Lake), 539, Stretching boots and shoes.
, J., & Judson, J., 304, Sewing machines.
on, James, 383, Condensing, refrigerating, &c.
— John, Loynd, W., & Clayton, R. H., 537, Air
[pumps.
on, T. W., & Richardson, A. P. (Haseltine), 1109
[(*App.* 40.) Looms.
, J. J., 485, Tin and lead piping, &c.
.(Johnson), 358, Lowering and hoisting apparatus.
, J., & Rawsthorne, S., 62, Sizing yarns.
– O. H., & Smith, J. H., 188, Self-acting mules.
ann, G. H. J. & W., 229, Locking and unlocking
[railway carriage doors.
— W. & G. H. J., 229, Locking and unlocking
[railway carriage doors.
J., & Pryer, G., 581, Ships' sails.
, J. F., 258, Umbrellas, &c.
ne, G. (*Jones & Pauly*), 35, Steam-engines.
— (*Thurston*) 96, Testing wood, iron, &c.
— (*Beckwith*), 474, Sewing-machines.

Haseltine, G. (*McGhee & Risher*), 807 (*App.* 36.) Steam-
[engines.
——— (*Hopper*), 815 (*App.* 36.) Dry gas-meters.
——— (*Meaker*), 937 (*App.* 38.) Hoistway doors.
——— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep
[shears.
——— (*Harrison & Richardson*), 1109 (*App.* 40.)
[Looms.
——— (*Larer & Griscom*), 1129 (*App.* 40.) Millstones.
——— (*Smith*), 1219 (*App.* 41.) "Buttereine."
——— (*Read*), 1223 (*App.* 41.) Water-meters.
——— (*Isbell*), 1632 (*App.* 45.) Buttons.
——— (*Higley*), 1936 (*App.* 49.) Railway trucks and
[axle-boxes.
——— (*Dean, Smith, & Merrell*), 2001 (*App.* 50.)
[Millstones.
——— (*Thompson*), 2108 (*App.* 51.) Sewing machines.
——— (*Brayton*), 2209 (*App.* 52.) Gas-engines.
——— (*Walsh*), 2288 (*App.* 1.) Syringing bottles.
——— (*Baker*), 2289 (*App.* 1.) Scoop and sifter.
——— (*Crowell*), 2291 (*App.* 1.) Weavers' harness.
——— (*Bate*), 2352 (*App.* 2.) Refrigerating apparatus.
——— (*Dunning & George*), 2475 (*App.* 3.) Horse-
[shoes.
——— (*Rabbeth*), 2497 (*App.* 3.) Spinning machine
[spindles and bolsters.
——— (*Roach*), 2640 (*App.* 5.) Faucets.
——— (*Thurston*), 2741 (*App.* 6.) Forging, drilling
[and riveting.
——— (*Allen*), 2810 (*App.* 7.) Railway wheels.
Hazeldine, F., 565, Valves or taps.
Hearson, C. E., 167, Argand burners for gas and oils.
Heaton, C., 189, Emery and other grinding machines.
——— C., 689 (*App.* 5.) Emery wheels.
Heaton, D. (Bousfield), 2194 (*App.* 52.) Buttons.
Heaven, A., 446, Ornamenting woven fabrics.
Hedges, K. W., 463, Steam-boilers and engines.
Hedley, G. H. C., 123, Fire lighters.
Hellawell, H., & Norton, T., 381, Weaving velvets, &c.
Henderson, A. C. (*Gaylord*), 2110 (*App.* 51.) Fire-arms.
——— T., Thompson, W. P., & Smith, D., 569,
[Supplying fuel to furnaces.
Hennuy, E. J., 703 (*App.* 35.) Water-alarm.
Henry, W., 589, Carburetting hydrogen gas.
Hepworth, S. S., & Paulding, G., 1798 (*App.* 47.) Cen-
[trifugal machines.
Heywood, J. S. C., 216, Compositions for protecting the
[surfaces of ships, &c.
Heyworth, E., & Smalley, W., 375, Steam-boilers.
Hickisson, J., 279, Stoppering bottles, jars, &c.
Hicks, J., 544, Saving life at sea.
Higgins, C. S., & W. B., & Burns, J. (Bonneville), 1271
[(*App.* 42.) Waterclosets.
Higgins, F. H. W., & Davies, W. H., 640, Telegraph
[signals, &c.
Higgins, W. B. & C. S. & Burns, J. (Bonneville), 1271
[(*App.* 42.) Water-closets.
Higginson, A., 42, Governors.
Highton, H., 439, Electric telegraphs.
Higley, A. (Haseltine), 1936 (*App.* 49.) Railway trucks
[and axle-boxes.
Hill, D., & Black, W., 173, Soda.
— E. J., & Clark, J. L., 564, Railway signalling.
— H. C., 341, Winding yarn and thread.
Hindley, G., 526, Cutting and dressing stone.
Hipkins, D., 664, Artificial butter.
Hirsch, J. (Johnson), 594, Applying heated air.
Hock, J., 493, Motor engines.
Holden, E., 578, Preparing fibres for combing.
——— J. & J. E., 114, Washing wool.
——— J. E. & J., 114, Washing wool.
Holland, H., 641, Gas.
Holmes, F., 68, Polishing stone, &c.

Hooker, J., 477, Setting and distributing type.
——, W. D., 203, Steam-engines and pumps.
Hopcraft, T., 372, Telegraphing in ships, hotels, &c.
Hopkinson, C., & Palmer, W., 572, Dressing flour.
Hopper, T. C. (Haseltine), 815 (*App.* 36.) Dry gas-meters.
Horrocks, J., 352, Furnaces.
Howard, J., & Bousfield, E. T., 178, Steam cultivators.
—————— 331, Steam-boilers.
Howes, W., & Burley, W., 303, Carriage lamps.
Hoyle, A., & Clegg, E. A., 650, Looms.
Huerne, P., 207, Self-cleaning water filters.
Hughes, E. T. (*Libotte*), 157, Safety cages for mines, &c.
—— (*Whitney*), 628, Fire-arms.
—— H., 399, Ornamenting ribbons, &c.
Hulett, D., & Chandler, S., 1287 (*App.* 42.) Gas.
Hunt, B. (*Enterprise Manufacturing Co.*), 606, Hand grinding mills.
Hunt, T. S. (Duncan), 546, Precipitating metallic copper.
Hunter, A. G., 907 (*App.* 49.) Carburetting air.
Huntington, F. A., Miller, W. J., & Swingle, A., 1141 (*App.* 40.) Fire-arms.
Hyatt, T., 432, Carriage and footways.
—— T., 478, Asbestos and its application.
Hynam, J., 615, Cigar lights, matches, and wicks.

I.

Ibbotson, H., 869 (*App.* 8.) Grinding corn.
Imhof, D., 182, Musical instruments.
Imray, J. (*Blair*), 308, Regenerative furnaces.
Ireland, A. (Johnson), 215, Rollers for spinning, &c.
Isaacs, D. M., 388, Fire escapes.
Isbell, R. H. (*Haseltine*), 1632 (*App.* 45.) Buttons.

J.

Jacobsohn, S. (Johnson), 349, Polishing floors, &c.
Jaehne, E. (Abel), 1610 (*App.* 45.) Buildings.
Jensen, P. (*Duval*), 13, Fire-arms.
—— (*Ericksen & Edwards*), 138, Vats, gas-holders, &c.
—— (*Gibson & Sons*), 273, Wood working machinery.
Johnson, Job, 674 (*App.* 8.) Ball casters.
—— John C., 76, Twist lace machines.
—— John H. (*Nes*), 10, Steel.
—— (*Cambon & Co.*), 18, Preserving fabrics, wood, &c.
—— (*Mousseron*), 73, Warming railway carriages.
—— (*Lamarre*), 214, Compositions for signalling and illuminating.
—— (*Ireland*), 215, Rollers for spinning, &c.
—— (*Pollok*), 247, Shoe tips.
—— (*Jacobsohn*), 349, Polishing floors, &c.
—— (*Hart*), 358, Lowering and hoisting apparatus.
—— (*Plantrou*), 420, Carding &c. fibres.
—— (*Lissagaray*), 455, Preserving eggs.
—— (*Walker & Co.*), 475, Heckling fibres.
—— (*Hirsch*), 594, Applying heated air.
—— (*Kolbe*), 595, Acids.
—— (*Harmignies*), 658, Steam-engines.
—— (*Marrel, Brothers*), 663, Armour plates.
—— (*Miles*), 761 (*App.* 8.) Preserving eggs.
—— (*Winans*), 893 (*App.* 37.) Organ stops.
—— (*Peckham*), 1858 (*App.* 48.) Iron and steel.
—— (*Thorp*), 2100 (*App.* 51.) Cooking, lighting, &c.
—— (*Gray*), 2646 (*App.* 5.) Transmitting musical tones.
—— S. H., 19, Sulphur.
Johnston, W., 531, Compressing air or gases.
Joly, A. (Bonneville), 518, Fire alarms.
Joly, R. (Brewer), 433, Incinerating vegetable substances from wool, &c.
Jones, D., 1429 (*App.* 43.) Lubricating valves and cylinders.
—— E., 194, Cartridge cases.
—— E. F., 668, Lamps.
—— J. A., 645, Window sashes.
Jones, T. L., & Pauly, A. (Haseltine), 35, Steam-engines.
Joy, D., 366, Hydraulic motive-power engines.
Judson, J., & Harris, J., 304, Sewing-machines.

K.

Kay, R. H., & Richardson, A. T., 387, Silk crape.
Kaye, G. R., 368, Cutting or reducing meat.
Kayser, C. W. (*Schultz*), 488, Steam and other engines.
Keats, A. & J., & Greenwood, A., 620, Sewing boots, &c.
—— J. & A., & Greenwood, A., 620, Sewing boots, &c.
Kemp, F., 608, Railway couplings.
Kendall, J. L. (Lake), 701 (*App.* 35.) Floor coverings.
Keniston, C. (Morgan-Brown), 5, Boot and shoe fastenings.
Kennedy, De L., 860 (*App.* 37.) Gripping tools, punches, &c.
—— W., 65, Supplying brushes with powder.
Kent, G., & *Adam, J.*, 638, Cutting fruit and vegetables.
Kessel, G., & Seydeler, G., 149, Distance indicators.
Kiddill, J., jun., 536, Poultry fountains.
Kinder, E. C. & J. T., 259, Smoking and fumigating.
—— J. T., & E. C., 259, Smoking and fumigating.
King, F. J., 296, Treating and separating ores.
Kinney, I. (Marsh), 1865 (*App.* 7.) Clamping tools and screw wrenches.
Kirk, W., 187, Shuttle tips.
Kirkwood, J. T., & Smith, W. H., 609, Carbonising metals.
—— J. T., & Smith, W. H., 610, Treating metals.
Kitchin, J., 604, Steam-boilers.
Klein, F. & Co. (Mills), 665, Felt hats.
Klett, F., Stoffler, A., & Schmittzche, A. (Arnheim), 597, Lithographic presses.
Knab, D. C., 53, Preventing incrustation in boilers.
Knapp, H. F. (Browne), 66, Raising sunken vessels.
Knowles, J., 574, Preparing cotton and other fibres.
Kolbe, H. (Johnson), 595, Acids.
Krom, S. R., 1058 (*App.* 39.) Crushing and separating ores.
Künzel, C. (Vaughan), 1628 (*App.* 45.) Metallic bearings.
Kyte, C. (*Wilson*), 339, Metallurgical furnaces.

L.

La Bastie, F. B. A. R. de, 2783 (*App.* 7.) Tempering glass.
Lacaze, A. (*Capon*), 287, Looms.
Lafaurie, H. F., & Potel, H. F. E. (Wise), 2650 (*App.* 5.) Lamps.
Lafferty, H. W., & R., 754 (*App.* 36.) Corrugating cylinders.
—— 755 (*App.* 36.) Centrifugal draining machines.
—— R., & H. W., 754 (*App.* 36.) Corrugating cylinders.
—— 755 (*App.* 36.) Centrifugal draining machines.
La Grove, W. A. P. (Clark), 292, Mechanical toy.
Laird, J., jun., & Rutherford, W., 671 (*App.* 8.) Weaving bags, &c.
Lake, J., 174, Regulating draught in steam generators.
—— W. R. (*Allen*), 80, Adjustable pulleys.
—— (*Griffin*), 212, Peat-fuel.

W. R. (*Myers*), 233, Ventilating and warming.
(*Leighton*), 261, Lamps.
(*Shepard & Seaman*), 278, Pails, cotton cans, &c.
(*Maldant*), 342, Wet gas meters.
(*Cattanach*), 423, Gum, &c.
(*Poole*), 473, Life buoys.
(*Harris*), 539, Stretching boots and shoes.
(*Wilson*), 570, Paddle wheels.
(*Perry*), 585, Hay tedding machines.
(*Floyd*), 679 (*App.* 35) Gas-retort joints.
(*Kendall*), 701 (*App.* 35.) Floor coverings.
(*Brown*), 1421 (*App.* 4.) Rotating shaft indicators.
(*Cottingham*), 1730 (*App.* 46.) Ironing machines.
(*Cliff & Voce*), 2712 (*App.* 6.) Elliptic springs.
rre, E. A. A. (Johnson), 214, Compositions for
[signalling and illuminating.
ert, D. (Bonneville), 110, Coal pit wagons.
nt, J., 3, Gas making.
— J., 226, Waterclosets and cisterns.
ster, J., 46, Horse-shoes.
—— T., 32, Supplying fuel to furnaces.
m, E. (Wirth), 2606 (*App.* 5.) Refining sugar.
, *D., & Griscom, S. E.* (Haseltine), 1129 (*App.* 40.)
[Millstones.
e, W. W. de, & Shaw, W. T., 311, Date indicators.
, B. C. (*Sleath*), 549, Metal rolls, pipes, wheels, &c.
m, J. W., & Tracy, H. R. (Clark), 363, Sewing
[machine cabinets.
by, J., 113, Umbrellas, parasols and sunshades.
V. E., 223, Hydraulic motive-power engines.
q, F., 221, Horse-shoes.
, J., 545, Cutting paper and pasteboard.
f, H., Girvan, J., & Cathro, J. J., 394, Ornament-
[ing paper.
ook, J., & Mills, J. H., 487, Railway signals.
J. L. (Bonneville), 471, Table tops.
, E. A., 398, Carding and spinning fibres.
ton, C. H. (Lake), 261, Lamps.
ens, A. (Gottheil), 36, Dyeing warps.
r, F. (Dewynter), 430, Purifying gas.
, S., 629, Heating and cooking apparatus.
, G. C. L., 67, Holding chain cables.
L., 8, Fire escapes.
rdt, F., & Gilbert, W., 434, Pen and other boxes.
e, A. L. J. (Murdoch), 97, Obtaining potash.
on-Gower, G. G. W. Sutherland- (Duke of Suther-
[land), 319, Steam cultivators.
G. (Hache), 301, Gas pressure indicator.
, A. & G., 252, Trucks or barrows.
G. & A., 252, Trucks or barrows.
J. W., & Wood, G., 180, Stoves or ranges.
e, N. (Hughes), 157, Safety cages for mines, &c.
ody, A., & W., 523, Lamps.
— W., 117, Lamps.
— W., & A., 523, Lamps.
Co., Universal Signal (Clark), 2390 (*App.* 2.)
[Signal lanterns.
, *A. L.* (Clark), 323, Drying and heating.
rd, C. L., jun. (Gedge), 242, Gas burners.
cott, C. A. (*Conklin*), 237, Condensed milk.
aray, H. A. P. (Johnson), 455, Preserving eggs.
, S. C., 280, Combustion of fuel, &c.
S. C., 299, Combing waste silk, &c.
rte, R., & Quintaralle, R. (Clark), 593, Ships.
vood, P. E., 289, Treating beer, ale, &c.
nsohn, J., 162, Packing-case screws.
x, H., & Bradbury, G. F., 263, Sewing-machines.
R., 613, Heating flat irons.
E., 146, Sizing and drying yarn.
p, H. O., 1780 (*App.* 47.) Ferrules.
gny, Comte de Beaurepaire de, 591, Alcohol.
C., 425, Separating, &c. chemical products.
E., 326, Artificial fuel.

Lowe, S., & White, S., 636, Railway signals.
Lowry, G., 217, Governors.
Loynd, W., Clayton, R. H., & Harrison, J., 537, Air
[pumps.
Lucas, E. F. R., 317, Anthracene.
—— T., & Clegg, T., 623, Carding engines.
Lumley, T., 403, Steam pumps.
Lynde, J. H., 532, Tramways.

M.

McBeath, C., 601, Retorts or stills.
Mac Callan, G., 444, Reflectors.
Mc Feely, M., 522, Distilling spirits.
Mac George, I. M., 618, Regulating speed of engines.
Macgeorge, W., & McNeil, J., 51, Water tubes for boilers.
McGhee, J. H., & Risher, T. A. (Haseltine), 807
[(*App.* 36.) Steam-engines.
McInnes, J., & Steel, J., 74, Railway breaks and signals.
Macintosh, J., 234, Cigarettes.
———— J., 447, Insulating telegraph wires, &c.
———— J., 449, Roads and ways.
Mackenzie, G. N., Brocchus, P. E., Morris, G. W., &
[*Robinson, J. S.* (Benson), 64, Metal furnaces.
Mackie, S. J., 440, Signalling on trains.
McKinley, R. (Clark), 438, Hoeing, &c.
McLean, J. P. (Brewer), 2629 (*App.* 5.) Clasps for
[stays, &c.
MacLean, R., 395, Preventing railway accidents.
McMillan, D., 150, Cleaning machinery belts.
Macmillan, N., sen., 240, Finishing woven fabrics.
Macnab, W., 127, Steam-boilers.
McNeil, J., & Macgeorge, W., 51, Water tubes for boilers.
Maigron, F., 1822 (*App.* 48.) Spinning, doubling and
[twisting.
Makin, S., & Skerratt, W., 453, Spinning.
Maldant, E. C. (Lake), 342, Wet gas meters.
Manley, W.R. (Bousfield), 58, Rotary engines and pumps.
Mann, W. T. (*Watson*), 356, Cranes.
Mansley, J., 78, Compound engines.
Manson, W., 1603 (*App.* 45.) Pneumatic hammers, &c.
Maplesden, J., & Buss, W., 361, Ploughs.
Marchand, H. E. (Bonneville), 1170 (*App.* 41.) Rail-
[way breaks and couplings.
Marchant, J., 415, Safety signals for railway points.
———— R. M., 509, Motive-power engines.
Marlow, J. B., Roebuck, J., & Fallows, J. T., 274, Rail-
[way points.
Marrel, Brothers (Johnson), 663, Armour plates.
Marsh, T. H. (*Kinney*), 1865 (*App.* 7.) Clamping tools
[and screw wrenches.
Marshall, J., 85, Thrashing machines.
———— J., 460, Portable steam-engine furnaces.
———— W., & Crosskill, T. A., 118, Wringing and
[mangling.
Martin, C. (Bonneville), 2536 (*App.* 4.) Spinning fibres.
Martin, S. B., 936 (*App.* 38.) Ice-making, &c.
Mason, T., 99, Mounting and fastening stereotype plates.
Mathieson, J., 238, Torpedoes.
Maw, A., 264, Moulding plastic materials.
Maxwell, J. R., & Cope, E. (Benson), 1086 (*App.* 40.)
[Steam-engines.
Maynes, J., 306, Turning and cutting wood, metal, &c.
Meaher, J. W. (Haseltine), 937 (*App.* 38.) Hoistway
[doors.
Mehl, E. (Gottheil), 21, Treating wool.
Meldrum, E., 559, Fire-places.
Mellard, J., Sykes, J., & Bateman, T. S., 145, Rolling
[metals.
Mellor, H. M., & Woodward, L., 632, Knitting machines.
Mercer, T., & Duckett, G., 4, Size.

Merrell, H., Dean, S., & Smith, W. H. (Haseltine), 2001 [(*App.* 50.) Millstones.
Merriam, L. P., 370, Soldering metals.
Mestre, A. de (Bonneville), 683 (*App.* 35.) Wiring [bottles.
Mewburn, J. C. (*Chalumet*), 156, Textile fabrics.
Micheá, P. P. F., 284, Tannin and canocarpine.
Middleton, E. E., 409, Lengthening ships.
Miles, D. (Johnson), 761 (*App.* 8.) Preserving eggs.
Miller, J., 241, Glue.
—— J. A. (*Brown*), 98, Treating fatty matters.
—— W. J., Swingle, A., & Huntington, F. A., 1141 [(*App.* 40.) Fire-arms.
Mills, B. J. B. (*Rolland & Vanhoorde*), 635, Wheelbarrows.
—— (*Klein & Co.*), 665, Felt hats.
—— J. H., & Ledbrook, J., 487, Railway signals.
Miltimore, G. W., Phillips, M., & Morris, R. H. (Clark), [2498 (*App.* 3.) Railway carriage axles.
Mirfield, M., & Scott, J., 573, Combing fibres.
Mohr, C., 152, Rivetting joints and seams of boxes, &c.
Moison, T., 196, Drying textile materials, &c.
Molloy, B. C., & Fitzgerald, D. G., 266, White lead.
Molyneux, E., 61, Extracting tea.
Monckton, E. H. C., 265, Magnetic engines.
—— E. H. C., 2581 (*App.* 4.) Peat-fuel, &c.
Moore, J. W., & Norman, J., 489, Harness saddles.
Morgan-Brown, W. (*Gardner & Pocock*), 450, Boots.
—— (*Keniston*), 5, Boot and shoe fastenings.
—— (*Osgood*), 2875 (*App.* 8.) Composition [for printers' rollers, &c.
Morrill, J., 267, Pinch bars.
Morris, G. W., Robinson, J. S., Mackenzie, G. N., & [Brocchus, P. E. (Benson), 64, Metal furnaces.
—— *R. H., Miltimore, G. W., & Phillips, M.* (Clark), [2498 (*App.* 3.) Railway carriage axles.
Mortimer, M., & Bateman, D., 2254 (*App.* 1.) Looms.
Morton, D., 588, Steam-boiler furnaces.
Morton, J. S. (Clark), 290, Propelling vessels.
Mouly, F. V., 2566. (*App.* 4.) Heating and ventilating.
Mouret, L. J. N., 2699 (*App.* 6.) Model globes.
Mousseron, J. C. T. (Johnson), 73, Warming railway [carriages.
Mueller, P. E. (Abel), 1636 (*App.* 46.) Separating silk [rag fibres.
Muntz, P. A., & Sharp, T. B., 667, Condensing fumes in [furnaces.
Murdoch, H. H. (*Lesage*), 97, Obtaining potash.
—— (*Picard*), 454, Treating leather.
—— (*Shaw*), 2246 (*App.* 1.) Joining and closing [metal pipes.
Murrow, Y. J., 1063 (*App.* 39.) Waterproof plates or [panels.
Muzzarelli, A., 324, Bleaching animal glue.
Myers, A. G. (Lake), 233, Ventilating and warming.

N.

Nangle, W. C., 557, Anti-fouling compound.
—— 1606 (*App.* 1.) Compound for coating metal, &c.
Napier, J. D., & R. D., 580, Winches, &c.
—— J. M., 131, Bottle labels.
—— R. D., & J. D., 580, Winches, &c.
Needham, W., 583, Signalling on railways.
Negretti, H., & Zambra, J. W., 109, Thermometers.
Nehrlich, H., 1873 (*App.* 48.) Producing cold and mo- [tive power.
Nes, C. M. (Johnson), 10, Steel.
Neuhoff, W., 627, Baths.
Newall, R. S., & Bowman, H., 165, Muriatic acid gas.
Newbold, E., 385, Furnace bars.
Newcomb, E., 2722 (*App.* 6.), Car replacer.
Newton, A. V. (*Sinclaire*), 205, Filtering liquids, &c.
—— (*Wilbur*), 441, Metal tubing.
—— (*Babbitt*), 459, Steam-boilers.
—— R., 106, Fire bars.
—— W. E. (*Phillips*), 72, Hydrate of magnesia.
—— (*Stone*), 94, Electro-magnets.
—— (*Stevens*), 418, Shears for cutting metal.
Newton, A. V. (*Wilson & Folk*), 458, Bolsters and bear- [ings for spindles.
Nicholls, H. M., 41, Cutting and piling paper.
Nitzke, A., 654, Cartridges.
Noakes, E., 332, Hop kilns.
Noble, A., 554, Projectiles for rifled ordnance.
—— F. J., 291, Ratchet braces.
Norman, J., 169, Clipping horses.
—— J., & Moore, J. W., 489, Harness saddles.
Norris, R. S., 132, Cutting or getting coal.
Northcote, G. B., jun., 445, Cleaning boots.
Norton, T., & Hellawell, H., 381, Weaving velvets, &c.
Nugent, E., & Fanning, J., 191, Screws.

O.

Oesten, G. (Gottheil), 6, Measuring heat of fluids in pipes.
Oldershaw, H. A., 472, Boots and shoes.
Orr, J. B., 517, Obtaining white pigments.
Osgood, F. (Sawyer), 1593 (*App.* 45.) Tables.
—— *J. H.* (Morgan-Brown), 2875 (*App.* 8.) Com- [position for printers' rollers, &c.

P.

Page, P. S. (*Todd*), 1853 (*App.* 48.) Car couplings.
Page, P. S., & Williams, T. S. (Curtis), 24, Lamps.
Page, R. W., 27, Actuating valves of steam engines.
—— T., 470, Steam ships.
Painter, W. (Benson), 121, Pump valves.
Palmer, W., & Hopkinson, C., 572, Dressing flour.
Pakenham, T., 285, Singeing pigs.
Parker, J., 7, Rolling wheel tyres.
Parsons, F., & Pratt, F. C. (Wise), 659, Railway wheels.
Paterson, J., 45, Capsuling bottles.
Patterson, J. (Wichmann), 410, Railway frog for crossings.
Pattison, G. C., 249, Fog signals and alarm bells.
Paulding, G., & Hepworth, S. S., 1798 (*App.* 47.) Cen- [trifugal machines.
Pauly, A., & Jones, T. L. (Haseltine), 35, Steam-engines.
Payne, J. H. (Whittingham), 348, Gas making.
Peak, J., 648, Weights, measures and coinage.
Peckham, E. (Johnson), 1858 (*App.* 48.) Iron and steel.
Peel, J., & Emsley, S., 47, Looms.
——, J., & Emsley, S., 632, Looms and pickers.
Peer, J. A., 1497 (*App.* 44.) Cutting toothed wheels and [racks.
Pelouze, E. P., & Audouin, M. E. P. (Clark), 322, Gas.
Pendred, V., 516, Steam-boilers.
Perkins, C. H., & Stowe, J. L. (Smith), 592, Clearing [snow from tramways, &c.
Perks, T., jun., 550, Fastenings for brooches, &c.
Perry, R. G., 55, Kilns for drying peat, malt, &c.
Perry, S. (Lake), 585, Hay tedding machines.
Petrie, J., jun., 43, Washing and dyeing wool, &c.
Phillips, C. H. (Newton), 72, Hydrate of magnesia.
—— *M., Morris, R. H., & Miltimore, G. W.* (Clark), [2498 (*App.* 3.) Railway carriage axles.
Picard, B. (Murdoch), 454, Treating leather.
Pichard, L. M., 416, Carding engines.
Pickup, J., 436, Looms for weaving.
Pindar, A. G., & W., 125, Dressing flour, &c.
—— W., & A. G., 125, Dressing flour, &c.

., 634, Distilling oils or perfumes.
, C. N. (Johnson), 420, Carding &c. fibres.
H., 553, Combined bottle stopper and drinking
[vessel.
E., & Gardner, C. F. (Morgan-Brown), 450,
[Boots.
A. (Johnson), 247, Shoe tips.
. T. (Lake), 473, Life buoys.
H., jun., & Greenwood, J., 126, Weighing
[machines.
. A. (*Quackenbush*), 2284 (*App.* 1.) Toy guns.
. H. (Talcott), 148, Screws.
. F. E., & Lafaurie, H. F. (Wise), 2650 (*App.*
[5.) Lamps.
, W., 52, Unloading ships' cargoes.
, A., 185, Destroying insects.
, J. A., 390, Steering apparatus for ships, &c.
. C., & Parsons, F. (Wise), 659, Railway wheels.
. W., & Green, H. T., 29, Railway breaks.
., 2465 (*App.* 3.) Constructing vessels to facilitate
[loading.
, A., & Sanderson, S., 600, Fire-places.
., & Harvey, J., 581, Ships' sails.

Q.

bush, H. M. (Pope), 2284 (*App.* 1.) Toy guns.
, 63, Protecting india-rubber valves, &c.
, 496, Cigar cases.
lle, R., & Lo Forte, R. (Clark), 593, Ships.

R.

, *F. J.* (Haseltine), 2497 (*App.* 3.) Spinning
[machine spindles and bolsters.
, J., 136, Safety valves.
n, J. C., 325, Spinning fibres.
., 295, Plaited or folded fabrics.
. R., Comte de Beaurepaire de Louvagny, 591,
[Alcohol.
rne, S., & Hartley, J., 62, Sizing yarns.
(*David*), 100, Producing optical illusions.
., 406, Bottle stoppers.
. F. (Haseltine), 1223 (*App.* 41.) Water-meters.
, E., & Ellis, J. E., 172, Treating hides and skins.
, *F. A. E.* (Abel), 168, Tell-tale pressure gauges.
., 355, Boilers and furnaces.
, *W. G., Roberts, H., & Brocchus, P. E.* (Benson),
[495, Welding copper.
s, L. J. (Craps & Derihon), 529, Non-conducting
[mastic.
J. F., fils (Gedge), 130, Steam generators.
F., 535, Elevating grain from ships.
G., 300, Syphons.
, *S.* (Cockings), 154, Snaps or connectors.
s, W. F., 101, Ships' compasses.
— W. F., 515, Engine speed indicators.
s, J., 376, Bicarbonate of soda.
W., 567, Gas.
on, A. P., & Harrison, T. W. (Haseltine), 1109
[(*App.* 40.) Looms.
on, A. T., & Kay, R. H., 387, Silk crape.
d, T. & W., & Baron, J., 501, Looms.
— W. & T., & Baron, J., 501, Looms.
T. A., & McGhee, J. H. (Haseltine), 807
[(*App.* 36.) Steam-engines.

Roach, F. (Haseltine), 2640 (*App.* 5.) Faucets.
Robert H. (Clark), 547, Clocks.
Roberts, H., Brocchus, P. E., & Rehbein, W. G. (Benson),
[495, Welding copper.
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Page 177, line 42, *for* " Clayton, Mewburn John " *read* " Mewburn, John Clayton."

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CHRONOLOGICAL AND DESCRIPTIVE INDEX
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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 22 to February 28, 1874.

A.D. 1874, February 23.—No. 669.

VICARS, Thomas, the elder, and **VICARS, Thomas**, the younger, both of Liverpool, in the county of Lancaster, engineers, and **SMITH, James**, of the same place, baker.—" Improvements in steam generators " and self stoking furnaces therefor."

The main object of this invention is to provide an efficient steam generator for use in combination with the patentees' well known self stoking furnaces.

First. The steam generator has water tubes which form the top and sides of the furnace, the front ends of such tubes being connected into a supporting box of rectangular or other shape.

Second. In combination with the first part is a flue or flues passing through the lower shell or shells of the generator. The flames and heating gases strike against the front supporting box and the water tubes, and pass thence through the flue or flues and around the shell or shells to the chimney.

Third. The self stoking furnace patented in 1868, No. 3166, is modified to suit the new steam generator by increasing the distance between the fuel feed and fire bars to about twenty inches, employing three or more feed plungers placed above the furnace door; and building a brick arch between the ashpit and the plungers.

The modification of steam generator preferred is described.

A.D. 1874, February 23.—No. 670.

ELDER, George Fyfe, of Lochee, in the county of Forfar, North Britain, managing engineer of the Camperdown Linen Works.—" Improvements in crisping or doubling textile and other fabrics, and in the " machinery or apparatus employed therefor."

The features of novelty which constitute this invention are—

First. The curviform saddle.

Second. The roller and strap in the saddle for controlling the position of the cloth.

Third. The inclined or angular bars.

A.D. 1874, February 23.—No. 671.

LAIRD, John, the younger, of the firm of William Laird and Company, manufacturers, and **RUTHERFORD, William**, manager to the said firm, both of the town and county of Forfar, North Britain.—" Improvements in weaving bags, sacks, and other tubular and double fabrics, also single fabrics, " and in the means employed therefor,"

The features of novelty which constitute this invention are—

The improvements in the " Dobbie " machine, whereby its duplex action is obtained.

A.D. 1874, February 23.—No. 672.

WILKE, Henry, of 3, Crown Villas, Greengate Street, Plaistow, in the county of Essex, engineer.—" Improvements in steam boilers."

Inclined water tubes below a main or tubular boiler and through furnace and combustion chamber, with " up " tubes rising (from the inclined tubes) in and through the said chamber. Steam spaces in the " up " tubes in communication with each other and with steam space of boiler. Water tubes in communication with water space of boiler. Furnace bricked over, so that within its length flame cannot play on shell of main boiler. Sides of furnace and sides, top, and back of combustion chamber formed of iron cased with fire bricks, or otherwise wholly or partly of water chambers, which may be used as feed heaters open to the atmosphere, or closed and a safety valve applied. Other valves as required.

A.D. 1874, February 23.—No. 673.

BAGGS, Isham, of Surbiton, in the county of Surrey, practical chemist and electrician.—" Improvements " in electric telegraphy, and in the arrangement of apparatus employed therein."

This invention consists, firstly, in arrangements of apparatus and methods of working the same, whereby great force and intensity is given to very faint currents or impulses of electricity; secondly, in giving a directive force to currents of electricity, so as to cause them, as may be desired to traverse one or other of two remote arrangements of apparatus connected with the same line wire, and without the movement in such case of a needle, armature, or other analogous mechanical appliance; and, thirdly, in arrangements for sending a duplex message through instruments at one and the same time.

A.D. 1874, February 23.—No. 674.

JOHNSON, Job, of Brooklyn, in the county of Kings, and state of New York, United States of America. —" Improvements in ball casters."

At the bottom of the socket in which the ball turns is a hardened steel plate, and the ball is retained by a sleeve screwed upon the outside and interlocked to prevent unscrewing.

Intermediate balls when used between the main ball and steel plate are retained by a steadying disk.

A.D. 1874, February 23.—No. 675.

CONNELL, John, of Paisley, in the county of Renfrew, North Britain, manufacturer's foreman.—" Improvements in weaving ornamental fabrics."

Two distinct warps are used, one termed the working warp being a comparatively fine one, and interweaving with coarser or thicker wefts, which latter mainly form the surfaces of the fabric. The other warp is termed a dead or stuffer warp, and is not interwoven with the wefts. Wefts of different colors are used and consisting of two sets, and the result is like a double or two-faced cloth, the introduction of the dead warp attaining the important object of preventing the colors on one side from showing through to the other side, at the same time that it makes the fabric firmer and more substantial.

A.D. 1874, February 23.—No. 676.

HARVEY, Richard Sutton, of Retford, in the county of Nottingham, surgeon.—" Improvements in " privies and in dry earth closets."

According to this invention privies and earth closets have inclined receivers to lead the soil into receptacles outside of and clear of the buildings.

A.D. 1874, February 23.—No. 677.

NEWTON, Samuel, of Dudley, in the county of Worcester, forge and mill manager, and NEWTON, Charles, of West Bromwich, in the county of Stafford, millwright.—" Improvements in puddling furnaces " used in the manufacture of iron and steel."

This invention consists in forming in the bed or bed plates of the furnace a continuous channel by preference of a zig-zag figure, through which a current of water is passed, which water, by its cooling effect keeps the bed of the furnace at so low a temperature that it suffers little injury from the heat of the furnace. The cast iron plates forming the bed have imbedded in them wrought iron pipes of a **U** figure; or pipe like cavities of the same figure are made in the plates by the casting process.

The ends of the pipes or cavities are connected together by junction pieces, so as to form a continuous channel in the bed of the furnace for the cooling water to pass through.

A.D. 1874, February 23.—No. 678.

BARLOW, Henry Bernoulli, of Manchester, in the county of Lancaster, patent agent.—(*A communication from Nicolas Joseph Galland, of Paris, France, engineer.*)—" Improvements in brewing, and in the " machinery or apparatus employed therein."

The nature of this invention consists in a complete system of brewing, in which the various processes are performed in succession and in vacuum, and by means of recuperative heating apparatus, which effects a great saving in fuel and reduces the time required for performing the various operations. The invention consists,—

First, in the apparatus to wash the barley.
Secondly, the arrangement of malt kiln turrets.
Thirdly, the apparatus for washing and grinding malt.
Fourthly, the apparatus for saccharifying malt in vacuum.
Fifthly, the peculiar construction of a filter press.
Sixthly, the apparatus for boiling the wort and for applying the hops.
Seventhly, an apparatus for cooling wort, and
Eighthly, the arrangement of the recuperators of heat.

A.D. 1874, February 23.—No. 679.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from James R. Floyd, of the city and state of New York, United States of America.*)—" Improvements in air-tight joints for gas-retorts."

This invention relates to forming an air-tight joint for gas-retorts by attaching to the lid a fillet of lead extending around it near the edge; and providing the outer face of the flange surrounding the neck of the retort with a corresponding rib or projection that represents a sharp edge, which by pressure of the lid against the said neck is forced into the lead.

A.D. 1874, February 23.—No. 680.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—(*A communication from Camille Ferroux, of Goeschenen, in the Federal Republic of Switzerland.*)—" Improvements in rock drilling " machines."

This Provisional Specification describes a machine in which the front portion, with the tool carrier and tool, is fixed to a hollow piston rod from a cylinder forming the rear portion. Air or other fluid under pressure is admitted into the back of the rear cylinder and tends to constantly press forward the hollow piston rod and front portion of the machine, and at the same time passes through it to a cylinder in front and gives to its piston a reciprocating motion, thus giving a jumping motion to the tool. A shaft at the side worked by a small engine gives an intermittent rotary motion to the tool and also works the valves of the front cylinder. Arrangements for regulating the advance of the tool and for withdrawing it are also described.

A.D. 1874, February 23.—No. 681.

AGAR, Henry and George, of 3, Flowergate, Whitby, in the county of Yorkshire.—" An improved wind " and rain impervious door plinth."

The purpose of utility of our invention is to effectually prevent all draughts from under the door, when closed, but on opening the door to allow the same to travel over carpets, canvass, or mat.

A.D. 1874, February 23.—No. 682.

BENJAMIN, Henry, of Graham's Town, South Africa, gentleman.—" Improvements in the extraction " of oleagineus matters from wool washing suds, or other liquids containing soapy matters or grease, and " the production of tallow or oil from the resulting substances."

The features of my invention is in the extraction of grease or fatty matters from wool washing suds, and converting the same into tallow, soap, oil, and such like articles.

A.D. 1874, February 23.—No. 683.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Adrien de Mestre, a person resident at Bordeaux, France, merchant.*)—" Improvements in apparatus for the " manufacture and application of wire coverings for securing the corks of bottles containing sparkling wines " or other fermented or effervescent liquids."

The invention consists of several apparatus the combination of which constitutes a complete system of machinery for making, shaping, placing, fixing, and sealing linked wire caps formed with a single piece of brass, steel, or iron wire, and specially intended for use in closing bottles containing sparkling wines and other effervescing liquids.

A.D. 1874, February 23.—No. 684.

HIPKINS, DANIEL, of Tipton, in the county of Stafford, member of the Inventors and Patentees Protection Association, 11, Cherry Street, Birmingham.—"A new or improved method of manufacturing "artificial butter, and of clarifying or purifying rancid butter."

This invention consists, first, in making artificial butter by melting fat by means of steam or hot water. The fat is then drawn off and allowed to cool. It is then raised in temperature and the olein or softer part is removed by pressure from the stearine or waxy pat. The olein is then melted and suddenly cooled by plunging it into or agitating it in a cold liquid, and it thus loses its rough and granulated consistency, and becomes very similar to butter. Second. In purifying rancid butter by melting it and removing any deposit; then boiling it with lime water or other alkali and allowing it to settle; and finally, treating the liquor thus clarified by suddenly cooling it in water or other liquid as in the method first described. The artificial butter, or the clarified butter, may be used separately, or they may be mixed together in any desired proportions, and are perfectly pure and wholesome and free from deleterious qualities.

A.D. 1874, February 23.—No. 685.

WINGFIELD, WILLIAM CLOPTON, of Belgrave Road, Pimlico, in the county of Middlesex.—"A new "and improved portable court for playing the ancient game of tennis."

The feature of novelty of this invention consists in constructing a nem and improved portable court for playing the ancient game of tennis by means of an arrangement of oblong and triangular nets placed in certain positions to each other by means of standards and ropes driven and fixed to the ground.

A.D. 1874, February 23.—No. 686.

BETTELEY, JOSEPH HENRY, of Cornhill, in the city of London.—"A new and improved mode of stopping and starting tramway cars."

The feature of novelty of this invention consists in an improved mode of stopping and starting tramway cars by means of three bevel friction wheels, one of which is keyed on one of the axles of the car, the second one is loose thereon, and the third serves to convey motion from the fixed to the loose wheel. The loose wheel carries a pulley round which a chain fixed to springs may turn. A double pawl is placed on the face of the said pulley and acts on a cogwheel keyed on the axle. The combined action of the chain springs and cogwheel serves as a brake, and the recoil of the springs starts the car.

A.D. 1874, February 23.—No. 687.

JOHNSON, SAMUEL HENRY, F.C.S., of Lea Bank Works, Stratford, in the county of Essex, chemist.—"Improvements in the construction of furnaces and retorts for the manufacture of bisulphide of carbon."

This Provisional Specification describes using a horizontal retort for vaporising the sulphur and a vertical retort for heating the carbon. Suitable methods of setting the retorts are described.

A.D. 1874, February 23.—No. 688.

BAKER, GEORGE WALTON, of the city of Wilmington, in the county of Newcastle and state of Delaware, one of the United States of America.—"Improvements in sewing machines."

This invention relates to improvements in sewing machines, particularly applicable to sewing together the edges of wet and untanned hides and other chemically treated materials, and it consists,—

Firstly, in the general arrangement and combination of the different parts of a machine, whereby the principal working parts are placed above the table, whereby the same are out of the way of and are prevented from being injuriously acted upon by wet or chemically treated hides or other substances being sewn together thereby.

Secondly, the invention consists in the means for guiding and supporting the thread to form the stitches.

Thirdly, the invention relates to a novel application of the vibrating feed plate, arranged to work in connection with a vibrating needle and cast off.

Fourthly, to improvements in the construction and arrangement of the brake for the cast-off bar.

Fifthly, to improvements in the arrangement and construction of the cast-off, and

Sixthly, to improvements in the tension mechanism.

A.D. 1874, February 24.—No. 689.

HEATON, CHARLES, of New York, United States of America, at present residing at 22, Craven Street, Strand, London.—"Certain improvements in emery and other grinding machinery, and in emery or other "grinding wheels for use therewith."

The features of novelty consist in a device applicable to emery wheels or grindstones, which enables them to be run safely at extraordinarily high speed, and counteracts the tendency to burst, from or by centrifugal force; and while it enables the emery wheel or stone to be thus run, also prevents its wearing out of truth, or round; counteracts the tendency to jump or run irregularly now existing; and while it permits the wheel or stone to grind or cut the material acted upon and to wear away in so doing, it yet enables the same surface-speed to be maintained until the stone or wheel is worn out.

It further consists in a device by means of which, drills, chisels, or other tools may be accurately ground to the shape or angle desired; and in certain automatic mechanism which allows the tool-to-be-ground to be applied to the wheel or stone, either moving towards the work or from it, as desired.

It further consists in a device or mechanical arrangement which enables large wheels or grindstones to be easily and practically operated, removed, or renewed when worn out.

The device is applicable to emery grinding machinery as now made, and may be applied to emery wheels or grindstones as now made or produced.

A.D. 1874, February 24.—No. 690.

TURTON, THOMAS, of Liverpool, in the county of Lancaster, iron and steel manufacturer, and **LATHAM, ERNEST**, of Birkenhead, in the county of Chester, engineer.—"Improved apparatus for transhipping coal "and bulk cargo."

This relates to that class of apparatus in which endless travelling bands with buckets or their equivalents are used; and consists.

First. In making the whole apparatus portable on a ship longitudinally by mounting it on four or more wheels, the distance between the wheels on one side and those on the other being by preference equal to the width of the hatchway coombings. This for the purpose of giving stability.

Second. In using two or more endless chains or bands provided with hooks or their equivalents for carrying baskets or other containers; and making the said chains and other carrying pullies movable vertically in the rising frame for the purpose of bringing them close to the cargo to be discharged.

A.D. 1874, February 24.—No. 691.

BRIGHT, TYNDALL, of Liverpool in the county of Lancaster, merchant and ship owner.—(*A communication from Reginald Bright, of Melbourne, Victoria, Australia, merchant, and John Cosmo Newbery, of the same place, analytical chemist.*)—"An improved method of extracting gold from auriferous antimony ores, anti-"monial compounds, and antimonial mixtures."

Metallic antimony is fused with ores, compounds, or mixtures, and the gold thereby alloyed with the metallic antimony. The alloy falls to the bottom of the material under treatment, from whence it can easily be removed. When the alloy becomes sufficiently rich in gold—it may be by repeated use—such gold is removed by oxidizing the antimony in any of the ways at present known or suitable for the purpose.

A.D. 1874, February 24.—No. 692.

CRACKNELL, HORATIO WILLIAM, of 36, Spring Street, Paddington, in the county of Middlesex, house decorator.—"An improved sash fastener."

It works on the hinge principle, one plate is screwed on to the bottom of the top sash, the adjoining plate works on it like a hinge with an incision in it, and comes down on another plate screwed on to the top of the bottom sash which has a moveable thumb piece riveted underneath it, which thumb piece turns round and clinche the said plate.

A.D. 1874, February 24.—No. 693.

BROWN, ISAAC, of Elm Croft Grange, Edinburgh, North Britain.—"Improvements in the construction "and arrangement of pipes for watering streets or roads, and for the purposes of irrigation."

This invention consists in the employment of an iron pipe, in which pipe at any required distance apart are openings or spaces, which openings or spaces are closed up with rings or discs of lead or other metal which is not liable to corrode or rust, such rings or discs being screwed or otherwise fastened into the openings in the pipes made to receive them: these lead rings or discs are perforated so as to allow the water in the pipes when under pressure to flow through the perforations in minute streams. The pipe is imbedded in asphalte or other cement, and openings are left in the surface above those portions of the pipe fitted with the perforated lead as before described. The portions of the pipe fitted with lead discs or sheets as described are protected by shields, so formed as to allow the water coming through the perforations to flow through openings in such shields over the surface of the street to be cleansed or watered.

A.D. 1874, February 24.—No. 694.

HOPKINSON, Joseph Timothy, of 110, Newington Causeway, in the county of Surrey, tool maker.—"Improvements in window sash fastenings."

This Provisional Specification describes several improvements, the object of which is to prevent the fastenings being opened by a knife or other instrument pushed up through the opening between the sashes. These improvements do not complicate the fastening in the least.

A.D. 1874, February 24.—No. 695.

KEIGHLEY, John, plumber, of Bradford, in the county of York.—"Improvements in pickers used in "weaving, and apparatus therefor."

This invention relates to employing pickers made of metal, having tubes through which pass the spindles and lock picking boxes, in which are placed the picking material, which is formed of sizing, leather, and india rubber washers; the locks are made with angular pieces, fitting ribs cast in the boxes; keys are fitted in the locks, allowing the turning of the angular pieces on the ribs, locking the picking material in the boxes. Cloth or felt washers are placed in the tubes, forming lubricators for the spindles.

Springs are also fitted to the going parts, checking the pickers after the shuttles are gone; and direct levers are used fixed on the underside of the going parts, having leather or sizing traversing across the spindle boxes' bottoms, to catch the bottom parts of the pickers, checking them.

A.D. 1874, February 24.—No. 696.

EMSLEY, Sidney, agent, of Bradford, in the county of York.—"Improvements in apparatus for spinning "and twisting wool, cotton, silk, and other fibrous substances."

This invention relates to employing endless bands in proximity to the top of the spindles for drawing and draughting of fibrous materials; and to employing auxiliary drawing rollers of larger diameters than those used in spinning, and working by the sides of the ordinary drawing rollers, for making mottled yarn or for covering material with another of superior quality and value, during the process of spinning; also to regulating the tension or drag; and to employing a fixed spindle and flyer, to which is fitted a kind of zig-zag apparatus for the purpose of putting in the twist above the flyer, and before any tension or drag is put on, in the winding on the bobbin or spindle; for which latter method provisional protection was granted to him, December 12th, 1873, No. 4093.

The endless bands pass over the draughting rollers and carrier rollers, above and in proximity to the top of the spindles, supporting, carrying, and stroking in the fibres.

The auxiliary rollers work on the same shaft as the ordinary drawing rollers and by their sides, and are larger in diameter, draughting fibrous material to a longer length than the ordinary rollers, producing mottled yarn or covering one material by another of superior value; two different sets of rollers of different diameters are used to form one thread during the process of spinning. The tension or drag is regulated for ordinary throstle spindles by a lifter plate made hollow, having a movable lid in which are holes, and having bushes or projections fitted in, through which pass the spindles; the bushes pass the lid when at the bottom stroke, and have cloth washers of larger diameters; the bobbins are placed on these washers; the lid is actuated by eccentrics and gear fitted to the bolster rails, causing the lid to lift or fall, leaving the cloth washers to turn on the bushes, or on the bushes and lid, giving more or less friction.

On the top of the spindle or flyer is fitted an apparatus of a zig-zag shape, constructed with two wings folding one over the other, and having an aperture on each side for the thread to pass, forming a lock, giving the entire twist before passing the top of the spindle, and before any drag is put on.

For spinning and twisting at a great speed, the spindle is made short, and fixed in the bolster rail, in which is fitted a bush, upon which the wharle turns, having two uprights forming the flyer; a ring is formed in the centre to allow the thread to pass; the thread before arriving there passes round an arm, giving it friction; the uprights enter at the top loosely into a cup, giving it motion; this cup is fitted on the top of a short spindle, on the top of which is the zig-zag apparatus; two slides are employed working through the bush and wharle, working a small plate on the spindle, on the top of which an iron or other metal washer having indentations on each side for the uprights to slide up and down.

To regulate the drag of the bobbin, the surface of the spindle is reduced by making flat places.

A.D. 1874, February 24.—No. 697.

BRAIDWOOD, James Francis, of the Phœnix Gas Works, 69, Bankside, Blackfriars Road, in the county of Surrey, gas engineer.—"Improvements in apparatus for securing the lids or covers of gas and other "retorts."

This invention has for its object a more speedy and effectual means for securing the lids of gas and other retorts to their mouthpieces.

A.D. 1874, February 24.—No. 698.

SINGER, Isaac Merritt, of New York, in the United States of America, but now residing at Oldway House, Paignton, in the county of Devon, gentleman.—"Improvements in sewing machines."

My improvements consist mainly in improved means of presenting the goods or material to the needle to be sewn.

Instead of the serrated surface that usually comes in contact with the material to move it forward, and in order to facilitate the turning of the material, I use a feeding ring or rings which surrounds the needle, and which I place so that the needle or the track in which it travels will at all times be as near as possible in the centre thereof, so that the material can be turned on the feeding ring or rings at all times.

This feeding ring need not entirely surround the needle, providing it be a stationary ring or rings fixed on the feed dog of a **V**-shape, but the rings may not only be made stationary to the feed dog, but may be made to turn thereon by means of a groove made in it. When rings are used that extend entirely around the needle, the throat plate between the hole that is made for the needle to pass into and the screw that holds it to the table, is made with a depression large enough to receive the ring and the portion of the feed dog that is on that side of the needle.

And these rings that can turn independent of the feed dog may have a surface so formed that the material can turn upon it or them, and in some instances the loose ring or rings having the capability of turning with the material (or goods) or the material (or goods) turning on it or them may be preferred, or a ring having a serrated surface to come in contact with the material at one end, and smooth at the end to turn upon the feed dog, can be used, so that a handle or handles may project out over the top of the table and underneath the material (or goods), having an eye in the centre that must surround the said feeding ring in such a manner that the said handle or handles can turn the feeding ring forward or backwards at the will of the operator, and at the same time allow the feeding ring to play up and down through the eye of this lever or levers, so that the upper end of this feeding ring can present itself to the underside of the material (or goods) to feed it forward and to drop below the top surface of said eye to allow the feed dog to return back to its position ready to feed another stitch. This eye that contains the handle or handles, through which the feeding ring can slide up and down, and by being turned backwards or forward, carrying the feeding ring with it, by means of a slot in one and a feather in the other, need not necessarily itself raise up and down, although it will move forward and back with the feeding ring in a horizontal line with the top of the table, because the upper surface of said turning eye will always be below the top of the ring or rings on the throat plate around the needle, though it need not be but a very slight distance below the top of the said ring or rings, as the top of the eye has a smooth surface.

A universal top feed action, which may be accomplished in various kinds of sewing machines. Take (for example) the machine known as the Singer Manufacturing Company's, letter A, or family sewing machine, with its table that holds the projecting arm, which projecting arm sustains a horizontal top driving shaft, giving motion to a second or perpendicular shaft, the two shafts being set in motion by the present or similar means of operating the same.

First the shuttle, or the underneath concatenator, will be moved by the rotating of the lower end of the perpendicular shaft; and the lever that shall raise and lower the tube that surrounds the needle carrier, which tube shall contain the whole top feeding apparatus, will also be moved by the said perpendicular shaft. This arm that holds the horizontal driving shaft must be far enough above the top of the table of the machine to not only give the requisite stroke of the needle carrier to perform the operation necessary for the needle to carry the thread down and up through the fabric or material to be sewn, but to admit of a sliding action of the tube that surrounds the needle carrier, which must be so made that the thread can pass down inside of the bearings or lugs in which it moves through, either by having a depression made in one side of the needle carrier, or by having it hollow.

This sliding tube that is to slide up and down the needle carrier and contains the feed works, may pass up through the lugs that are on the end of the arm that sustains the needle carrier, thereby forming a bearing for the needle carrier to reciprocate in. In this case the needle carrier must be actuated by means that act above the upper end of the sliding tube, but if the needle carrier be actuated by a similar means as employed by the Singer Manufacturing Company's machine before referred to, the tube must not in that case be long enough to interfere with such action; for instance, it may pass into the lower lug only. Now this sliding tube near its top end, or some other suitable point, must have a groove made in its outer surface that shall extend entirely around it. The object of this groove is for the purpose of having the end of the lever before mentioned, which lever must work on a fulcrum at some convenient point between its ends, to enter into, so that as the sliding tube is turned round the needle carrier, this groove will slide past the point of the lever, yet always embracing the point of said lever; therefore the lever, having an up and down motion only, is always ready to cause the sliding tube to reciprocate. Now this lever will extend back from the sliding tube to the perpendicular rotating shaft, and there will come in contact with a grooved cam, which will be attached to the said shaft. The groove in this cam will be so shaped as to lift the feeding dog clear from the top of the material to be sewn after the feeding has taken place, so that the feed dog can return, and then to let the feed dog down on to the goods again, and to let the sliding tube continue farther down, so that a wedged shaped cam that is affixed to the sliding tube, and turns with it, will come in contact with the upper end of a lever, and cause the material or goods to be fed forward to the needle.

On the sliding tube is a toothed pinion which contains the feeding lever or levers, although the sliding tube can slide up and down through the pinion, which cannot be turned around the needle carrier unless it carries the sliding tube with it, because a slot will be cut into the eye of the pinion, in which a feather or steady pin on the surface of the sliding tube must work into, or vice-versâ. On the lower end of the sliding tube is a flange, which when the feed has taken place must be below the underside of the pinion far enough, so that when the sliding tube begins to move upwards the wedged-shaped cam will be moved out of contact with lever No. 2, which lever actuates the feed lever, and then to come in contact with the underside of the pinion, lifting it up carrying the feeding apparatus with it, then letting the pinion with the feeding apparatus down until the dog comes in contact with the top surface of the material or goods, then continuing its descent downwards, forcing the wedged-shaped cam against the upper end of lever No. 2, thus causing the material or goods to be fed forward. This lifting of the feeding surface from the material or goods must begin as soon as the point of the needle enters the material or goods, and return to the material or goods in time to cause the needle thread to be formed into its loop underneath the goods for the purpose of making the stitch unless some other means be used to strip the material or goods from the needle.

Attached to the pinion or some part of the feeding apparatus there must be a spring so placed in connection with the feed that it will force underneath the lower side of the lower lug, and it must be made adjustable, so as to make the feeder press more or less upon the top surface of the goods or material while being fed forward. This lower or under side of the lower lug must have an even surface all the way round the needle, so as to present the same resistance to the spring on whatever side of the needle the spring may happen to be as the said spring travels around the needle with the feeding works.

The object of this toothed pinion is to have another toothed wheel to work into, which toothed wheel can be by means of a crank turned suddenly forwards or backwards, round and round, or on any part of the circle without hindrance, carrying the feeding apparatus and the sliding tube with it. This second toothed wheel may be sustained by a bracket fixed to the arm of the machine, or by any other convenient mode. If it be deemed necessary to change the direction of the feed or seam more rapidly than it is expedient for the hand to move, then by having the hand toothed wheel larger than the wheel or pinion that is on the sliding tube and carries the feeding apparatus, the desired object will be obtained. This second toothed wheel may be dispensed with, so can the toothed pinion that is on the sliding tube, because a lever or levers on a hand wheel can be attached to the hub that contains the feeding lever springs, and so forth, whereby the direction of the feed could be changed, but not so rapidly as when the second wheel is used.

The mode I prefer for accomplishing the graduating of the stitches and keeping the centre of the feeder to the centre of the track of the needle is as follows:—There must be two perpendicular levers connected to the pinion that surrounds the sliding tube; the lever that is next to the needle carrier must be hinged to the eye of the said pinion as high up above the pinion itself as it can be, and not come in contact with the wedged cam; therefore the eye of the pinion must project an inch and a half (more or less) above the body of the pinion, or a lug might be cast on the side of the pinion for the purpose of attaching this lever to it. The lower end of this same lever will contain the feeding ring or any other feeding surface that may be desired. Outside of the first lever and farthest from the needle bar is placed the second lever hinged to the lower part of the pinion, and these levers must be about a quarter of an inch apart. Both of these levers must pass up through the pinion between its eye and its periphery, and the upper end of the second lever will come in contact with the wedged shaped cam when the said cam is in its downward motion, which will force the upper end of said lever outwards, and it being hinged at or near its middle, which centre is at the lower side of the pinion, the lower end will be forced inwards towards the needle carrier. Now it will be observed that the hinged joint of lever No. 1 is an inch and a half more or less above the hinged joint of lever No. 2. It is quite clear that if a fulcrum be placed between the two levers, directly opposite to the centre of second or outside lever, that lever No. 1, containing the feeding surface, would not be moved either forward or back, although lever No. 2 might be forced outward by the descent of the wedged cam and inward by the returning spring, which spring must always return the lever No. 1 back to the same position by its being brought in contact with a positive stop; but if the fulcrum be moved below the centre of lever No. 2 ever so little, a short stitch would be the result and the movement of the feeder would be towards the needle carrier, and farther down that the fulcrum be moved towards the lower end of the levers the longer the stitches would become. In fact any length of stitch from any given length, say a quarter of an inch to nothing, would be the result. And if the fulcrum be moved above the centre upon which lever No. 2 rocks, a reverse action of the feeding lever will be the result.

The best mode of arranging the movable fulcrum is to have a slot made in the flat side of lever No. 2 that shall extend above and below the hinged joint that it rocks upon an inch and a half (more or less). This slot may or may not extend entirely through the lever parallel with the pivot of the hinge; a slot must also be made through lever No. 1 of the same or similar length to the slot in lever No. 2.

The slots in the levers must be perpendicular and parallel with each other when the feed dog is at the centre of its motion, at the same time the levers must be placed far enough apart, so as not to interfere with each other during their motion of feeding. The wedge shaped cam must also at this precise period have performed half of its action. Now then by placing a small piece of metal that shall extend across the flat surfaces of both the levers this small piece of metal (which must be a quarter of an inch wide, more or less) must have on its inner surface a tongue that shall fit into a slot of the lever No. 1.

In the other end of this piece of metal another tongue must project into the slot of lever No. 2, but must not be rigid like the tongue that projects into slot No. 1, but must be allowed to oscillate on a centre as the levers move forwards and backwards. Now it should be quite understood that this small piece of metal with its tongue at either end projecting into the slots of the levers can be readily moved up and down the said levers, and when moved to the point desired can be fastened in the lever No. 1 by a set screw inserted into the end of the tongue opposite the piece of metal. The reason why I prefer this kind of sliding fulcrum is that the lever No. 1 is carried both ways by a positive motion by the action of lever No. 2.

A.D. 1874, February 24.—No. 699.

PILKINGTON, Edward, of Rishton, and **ADDISON, George**, junior, of Clayton-le-Moors, both in the county of Lancaster.—" Improved apparatus for locking 'safety lamps' used by miners."

The invention consists principally of a spring bolt or latch working inside a small cylinder or tube, and locking the lamp automatically when the lamp top is screwed down into its place, which spring bolt cannot be withdrawn excepting by a person in possession of a special key adapted for the purpose.

A.D. 1874, February 24.—No. 700.

HUNT, Edmund, of Glasgow, in the county of Lanark, North Britain, patent agent.—(*A communication from George Gledhill, residing at Auckland, New Zealand.*)—" Improvements in bottles and stoppers for " aerated liquids."

The body is nearly cylindrical, being slightly tapered from the base towards the outlet end. The outlet is a short thickened nozzle formed immediately on the shoulder or end of the body. The stopper is a ball of rubber of a density to sink easily in the liquid. The nozzle is spherically shaped internally, so that the stopper ball may lodge in it against an ample surface which is a counterpart of its own form. The bottle is internally shaped at the shoulder so that when the contents are being poured out, the stopper ball rests in a concavity.

A.D. 1874, February 24.—No. 701.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Langdon Kendall, of Foxboro', Massachusetts, United States of America.*)—" An improved manufacture of substances to be used as floor-coverings and for similar purposes " from paper-pulp, sponge, and other like materials."

This invention relates to further improvements upon the " improved elastic material and method of manu- " facturing the same for stuffing mattresses, sofas, and chairs, and for other like purposes," for which Letters Patent were granted to me, dated 14th September, A.D. 1872, No. 2740.

A.D. 1874, February 24.—No. 702.

WESTON, John Henry, of No. 5, Lansdowne Crescent, Lansdowne Road, in the county of Surrey, gas engineer.—" Improved means of and apparatus for purifying, carburetting, and increasing the illuminating " power of coal gas."

The lower part of a divided vessel receives volatile oil from the upper part through a valve aperture, in proportion to escape of vapour, with a current of coal gas passing through the lower part before being burnt. The lower part has a series of hollow vertical wings filled with absorbent material, and the gas in its passage is caused to take a zigzag course to reach the outlet aperture in a thoroughly impregnated and purified state.

A.D. 1874, February 25.—No. 703.

HENNUY, Eugene Julien, engineer, of Charleville, in France, and of Frith Str., Soho, in the county of Middlesex.—" Improved apparatus for giving warning and indicating the presence of water in ships, " vessels and other structures."

In order to warn of the dangerous presence of water in the hold of ships or boats, a float or buoy is suitably connected by a rope or wire, with an alarum, in such a manner that when the former is lifted by the water it causes the bell of the latter to ring.

A.D. 1874, February 25.—No. 704.

HULME, Edward, of Liverpool, in the county of Lancaster, engineer, **HULME, John**, and **HULME, William**, of Bradford, in the county of York, engineers.—" Improvements in appliances for controlling " the admission of steam and other elastic fluids to motive power engines."

The main objects here are (a) to regulate the motion of the slide valve in such manner that an equal quantity of fluid shall be admitted to each end of the cylinder, and (b) to so arrange the governor that it will operate the expansion valve and maintain uniform speed of the engine.

Under the first part, eccentric or elliptical gearing is employed to drive the eccentric from the crank shaft. Under the second part a train of four wheels is employed to transmit motion from the crank shaft to the eccentric. The two intermediate wheels are held in contact with each other and with the first and fourth wheels by links. The governor, when it revolves above or below its normal speed, causes the two intermediate wheels to partly revolve around the first and fourth wheels in one or the other direction, and so alter the lead of the cut off eccentric. Elliptical or eccentric gearing connects the eccentric with the fourth wheel of the train.

A.D. 1874, February 25.—No. 705.

DAVEY, John, of Crofthole, in the parish of Cheviock, in the county of Cornwall, agricultural engineer and implement maker.—" Improvements in ploughs, such improvements being applicable to single-furrow, " double-furrow, and triple-furrow turn-wrest ploughs."

This invention consists in certain improvements which are applicable to single-furrow, double-furrow, and triple-furrow turn-wrest ploughs, but especially to double-furrow turn-wrest ploughs, whether the same are actuated by horse or steam power.

In the case of a double-furrow turn-wrest plough a horizontal boss is attached to the fore end of the front beam, which boss carries the front or furrow wheel or wheels, and which latter is or are self acting and runs or run in the furrow. The steerage wheel usually employed in double-furrow ploughs is dispensed with, and the steerage is affected by arrangements in connection with the draught part of the plough. The hind part of the frame is suspended on a wheel attached to the stilts, which are hung to the frame, and at the headlands are vertically reversed and held in proper working position by means of a catch, such operation being effected whilst the plough lies in a horizontal position and suspended on large bevel washers which are attached to the land wheels.

A.D. 1874, February 25.—No. 706.

TEULON, George Alexander, of 7, Haverstock Terrace, Hampstead, in the county of Middlesex.—"Improvements in rotary engines for operating propeller and other shafts where counter-thrust is "required."

Hitherto the reaction or thrust of the shaft of a screw or other similar propeller has generally been counteracted by expedients involving very considerable friction, and therefore to an equal extent a direct loss and indirect waste of propulsive power. The invention has for its object to cause such a counter-action by means of the prime mover as shall impart to the propeller shaft an axial strain (either of tension or of compression as may be necessary) in a direction contrary or opposite to the normal reaction or thrust of the propeller. The invention is applicable (by use either of steam or of other motive power) to other purposes where it may be necessary to maintain a continuous thrust or counter thrust combined with high rotary speed, as in boring machines in taking weight off the bearings of a turbine under a deep fall, and in other cases.

The inventor employs for this purpose an adaptation of the form of rotary engine (known as Hero's in relation to steam, or Barker's in relation to water) which revolves by the simultaneous action and reaction due to jets of the fluid employed issuing from tangential orifices in radial tubes or discs supplied from a hollow axis or shaft. The direction of these tangential orifices in Hero's and Barker's machines is normally in the plane of rotation, but according to the invention their direction is in a plane diagonal or inclined to the plane of rotation, and all of those for the time in action are open towards one side of the plane of rotation, whereby there will result on admission of steam (or other motive power employed) an axial thrust of the central shaft in the opposite direction combined with high rotary speed, and it at once becomes practicable to counteract the normal thrust of a screw or other similar propeller fixed on or connected to the same shaft while aiding its rapid rotation, and at the same time neutralizing most of the friction hitherto arising from the thrust. In carrying out the improvements the arms or discs of the wheel with their outlets may be made to revolve in a steam tight chamber, from which the exhaust steam may be conducted to an engine or engines acting directly on the main shaft.

Suitable valves and reversing gear are provided to alternate (as required) the direction of the fluid in escaping from the jets in the wheel to one or the other side of the plane of rotation, thereby altering the direction of the axial thrust.

Steam, gas, air, or water may be employed as the motive power.

A.D. 1874, February 25.—No. 707.

JACKSON, Albert, weaver, **JACKSON, George**, foreman twister, of Saltaire, near Bradford, and **SMITH, John**, engineer, of Bradford, in the county of York.—"Improvements in looms for weaving, and "in apparatus connected therewith."

This invention relates to employing a self acting apparatus for delivering the warps at any required tension, facilitating the pulling back and dispensing with the setting up, producing an even fabric and doing away with weights, levers, chains, or ropes heretofore employed. A self acting clutch made in two parts is employed spanning the circumference of the warp beam end; the bottom clutch has a lever passing downwards and through guides fixed to the loom frame stay; the top clutch has also a lever working by the side of the bottom clutch lever; near the bottom of the bottom clutch lever is a stud forming the fulcrum of a lever; the top clutch lever has also a stud on which rests the lever working on the fulcrum stud; on this lever is placed a weight made to slide. On the guides is fitted a spring attached to the levers of the clutches, giving a back lash to the warp beam. The weight on the lever forces up the lever of the bottom clutch and forces down the lever of the top clutch, pressing the clutches on the warp beam. Or the clutches are made in two parts joined by a link at the top; the levers, instead of being actuated by a weight and lever, have a chain or rope fitted to one of the levers working over a grooved pulley; a weight is attached to the chain or rope.

A.D. 1874, February 25.—No. 708.

COOKE, Ramsay, of Beaufort Villas, North End, Fulham, in the county of Middlesex, gentleman.—(*A communication from William Cooke, of Galt, in the province of Ontario and Dominion of Canada, gentleman.*) —"Improvement in button-hole stitching attachments for sewing machines."

Apparatus mounted on a frame inclined, to be attached to the head of a sewing machine and connected to the needle-bar to be operated, the said apparatus being arranged to cause a hook to pass down through the throat plate and engage the thread immediately after the shuttle has passed through the loop; draw it up through the button hole; and present it to a pusher, which by a portion of said apparatus is caused to carry the loop beyond the needle and hold it until the needle goes down through it and completes the stitch. Mechanism for operating the pusher. Also looping hook stock arrangements. Also cam-plate provided with arm bar springs and projection for releasing the hook stock, with the arm of the bar for turning the hook.

A.D. 1874, February 25.—No. 709.

HAARMANN, Wilhelm, of 34 & 36, Georgenstrasse, Berlin, in the Empire of Germany, analytical chemist, Dr. of Philosophy.—"A new process for the artificial production of vanillin by means of "coniferine, or the sap of plants belonging to the species of conifera, or any other plants related to this "family, as an extract of all those parts of the just mentioned plants containing coniferine."

Take first, coniferine, or, secondly, the sap of plants mentioned above which has been purified or liberated from albumina or other impurities; or thirdly, an extract of all those parts of the just mentioned plants containing coniferine; or, fourthly, the products obtained from coniferine by means of fermentation, putrefaction, or similar action; and treat one or other with oxydizing agents or such agents of similar action, such as bichromate of potassium and sulphuric acid or any other peroxide, oxide, acid, or salt, which produce the same effect. The product of the reaction in all these cases is artificial vanillin, which has been proved to be identical in all physical and chemical properties with the aromatic principle obtained by the extraction, etc., of the natural vanilla beams.

A.D. 1874, February 25.—No. 710.

LIGHT, Charles Llewellyn, of No. 5, Great Winchester Street Buildings, in the city of London, civil engineer.—"Improvements in the construction of railway and other wheels."

This relates, firstly, to making a single plate wheel, either with chilled tyres or prepared to receive rolled iron or steel tyres, which shall be shrunk on to the cast iron centres or otherwise, and secured on in the usual manner.

Secondly. To making by founding, railway, tramway, or other disc wheels of toughened iron, with the periphery founded or cast against a chill and cast at once in one entire piece.

A.D. 1874, February 25.—No. 711.

MORRIS, Charles Edward David, of the Vernon Iron and Tin Plate Works, Briton Ferry, in the county of Glamorgan, tin plate manufacturer.—"Improvements in apparatus used in coating metal plates "with tin or with other metals or alloys."

This invention relates to "tin-pots," and consists in forming or fixing in the interior thereof wings, ribs, projections, rails, or peforated plates, so as to block up a portion of the space ordinarily available for the plates to be tinned, and thus preventing the workman from inserting into the pot more than a certain number of plates at a time.

A.D. 1874, February 25.—No. 712.

SCOTT, William Middleditch, of the firm of W. and C. Scott and Son, of Birmingham, in the county of Warwick, gun manufacturers.—"Improvements in breech loading small arms."

This invention refers to the "fore ends" of drop down guns, and consists in binding the bar of the fore end to the loop on the barrels by means of a spring arm or lever or spring bolt or stud, either on the bar or in the loop. By this means the looseness of the fore end is removed and the abutment of the fore end is made to take a close bearing against the joint of the barrels.

This invention is applicable to fore ends fastened by the ordinary cross bolt or by a spring snap fastening.

A.D. 1874, February 25.—No. 713.

COTTON, William, of Loughborough, in the county of Leicester, manufacturer.—"Improvements in "means or apparatus for the manufacture of knitted fabrics."

The object of one part of the invention is to facilitate the passage of the thread carrier between adjoining needles when desired. For this purpose the feed end of the thread carrier for some distance up is formed comparatively flat and blunt knife edged, with such edges in a line transverse to the row of needles.

The object of another part of the invention is to obtain additional strength to jack or drawing sinkers, when the action upon them for "drawing" is effected by the direct action of the slur cock, by the application of additional or extended plates to their heads corresponding in thickness to the guage of the frame, and these strengthened parts are extended back, so that the action of the slur cock on them may not interfere with the dividers when dividers are used, or these extended parts may be applied only at intervals as may be desired for the dividing. These heads or thickened ends traverse in grooves at each edge.

The knocking over instruments or "bits" are applied separate between gated bars in place of in leads.

Another part of the invention relates to obtaining a succession of slack loops in the direction of the length of the fabric, as in the case of the inside of the heel of hose, by employing a covering point or instrument to cover a knocking over bit at the part desired, and thereby enabling such knocking over bit to draw off a longer loop. This point or instrument is formed with a hook or catch at its end to prevent the loop obtained from slipping.

Another part of the invention relates to means by which to stop the motions of the frame when thread breaks or fails in its passage to a thread carrier.

The object of another part of the invention is to enable the length of loops obtained during any course or series of courses in the production of parts of the fabric to be varied by giving extra motions to the needle bar at the drawing motion by the sinkers, at the part where the extra length of loop is required.

The improvements also relate to the application of the broad or other rib machine to the knitting frame driven by power.

Two different lengths of needles are applied to the "frame." The longer needles are set to incline forward of the other needles at their outer ends, and they act with the "machine" needles as press off needles in the formation of the ribs, by the transfer of the loops between the "frame" and the "machine" instruments, while the other or shorter needles act to produce the intermediate loops of the fabric.

An additional presser acts on the longer or press off needles during part of the operations.

When producing fashioning in such combined frame and machine, two separate narrowing machines are applied, and the covering points to act with the machine needles are capable of being operated to make extra traverse according to the number of loops in each rib by the use of incline or inclines and lever operated by cam or tappet, or such like means.

A.D. 1874, February 25.—No. 714.

STONE, Robert, of Liverpool, in the county of Lancaster.—" Improvements in the manufacture of and " mode of treating iron, and in apparatus employed therefor."

To obtain the object of this invention I construct a cupola furnace of the usual form, but having at intervals from the bottom loose grids or sieves of terra cotta, fire clay, or other suitable non combustible material placed between the layers of fuel and the pig iron, so that upon melting, the moulten metal will fall through to the bottom of the cupola, and the foreign matter be sifted, or sustained by the terra cotta grids, or sieves. In some instances I employ a vertical shaft in the cupola made of suitable non combustible material, and fitted with arms or provisions, so arranged that when the shaft is rotated, they will agitate the moulten metal, and by this means free the metal from all foreign matters. This shaft and the agitators may be suspended above the cupola and inserted thereinto when the metal is in a moulten state, and able by being agitated to give off its impurities.

A.D. 1874, February 25.—No. 715.

BOWN, William, of Birmingham, in the county of Warwick, manufacturer.—" Improvements in horse " clippers."

First. Holds the movable cutter in place by a T shaped clamping bar, through the centre of which passes a screw bolt which is intended to receive a clamping nut; and secondly, slots the fixed plate in lines parallel with the teeth, and chamfers the ends of the slots so as to facilitate the discharge of any hair or dirt that may work in between the cutters.

A.D. 1874, February 25.—No. 716.

PEARSON, Marshall Henry, and PEARSON, Joseph Thomas, of Little Neville Street, Leeds, in the county of York.—" Improvements in sewing machines."

Our invention consists in the application of one cam groove only, whether formed in a plate or barrel, fo actuating both the needle and shuttle in sewing machines.

A.D. 1874, February 25.—No. 717.

ROBINSON, Arthur, Henry, of Ealand Lodge, Merrion, in the county of the city of Dublin, Ireland, gentleman.—" Improvements in meters for measuring water and other liquids, and in motive power engines " parts of such improvements being also applicable to flushing water closets and preventing waste of " water."

My invention relates to a simple and effective means of measuring and indicating the quantity of water or other fluid passing through a meter, and consists of a peculiar arrangement of valves and mode of actuating the same, parts of which arrangements are applicable to hydraulic and other motive power engines and to the flushing of water closets and preventing waste of water.

A.D. 1874, February 25.—No. 718.

RAMSDEN, John Carter, of Smith House, Lightcliffe, in the county of York, silk manufacturer.—" Improvements in machinery for spinning, doubling, twisting, or winding, wool, silk, cotton, flax, or other " fibres."

This invention consists, Firstly, in improved apparatus for imparting rotation to the spindles of machinery for spinning, doubling, twisting, or winding fibres, and Secondly, in an improvement in the construction of the spindles employed thereon.

A.D. 1874, February 25.—No. 719.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Joseph Sladdin, of Lawrence, Massachusetts, United States of America.*)— " Improvements in loom harness, and in machinery for manufacturing the same."

The said invention particularly relates to that class of machinery in which are employed a two eyed stationary needle, a yarn twister, a heddle-eye former, a pusher, for pushing the heddle-eye from the heddle-eye former upon the stationary needle, and carriers for automatically carrying the heddle yarns from the stationary needle to the rig-bands; or in other words the said invention relates principally to improvements in the machines for making loom harness described in the Specification of former Letters Patent granted to James Ellis and Joseph Sladdin dated 15th January, A.D. 1864, No. 117.

A.D. 1874, February 25.—No. 720.

WOODCOCK, John, of Plymouth, in the county of Devon, brassfounder.—" Improvements in valves " for regulating the supply of water to cisterns or tanks."

My said invention relates to ball valves for regulating the admission of water to cisterns, tanks, and other vessels or receptacles. My improved valve is arranged to close the inlet aperture by moving across the same, so that in the act of closing no pressure has to be exerted to keep back the water, and no matter how great may be the pressure in the pipes, it will have no tendency to either open or close the valve.

A.D. 1874, February 25.—No. 721.

BAGGELEY, Henry, of No. 18 Gearve's Road, Crown Road, Fulham, in the county of Middlesex.—" Im- " provemements in the manufacture of earthenware."

This Provisional Specification describes making earthenware from a mixture of fire clay, Cornwall stone, sand, granite, and oxide of manganese.

A.D. 1874, February 26.—No. 722.

HALEY, Jonas, of the firm of Samuel Haley and Son, of Cleckheaton, in the county of York, card manufacturers.—" Improvements in wire cards, and in the machinery or apparatus used in the manufacture " thereof."

This invention relates to manufacturing wire elliptic, oblong, oval, or slightly flattened, having flat parallel sections, giving a solid base, and producing flat wire with two sections totally different.

Wire elliptic, oblong, oval, or slightly flattened is passed through rollers or dies, or suitable apparatus, which is slightly flattened; this wire so prepared passes through a pair of dies fitted to a setting machine; one of the dies is fixed, the other movable, and work in guides; the movable die is actuated by a bell crank lever, the short arm moving the die backwards or forwards, striking the wire, flattening portions of its length at intervals; the long arm is worked by an excentric lifting the levers, causing the short arm to move forward, and give the blow to the wire; the die is brought back by a spiral spring fitted to the long arm. The wire prepared is cut in lengths to form the teeth of the wire card; producing wire cards with teeth of equal thickness, quite straight, and with a solid foundation.

A.D. 1874, February 26.—No. 723.

STERNE, Louis, of 9, Victoria Chambers, in the city of Westminster, engineer.—" Improvements in rail- " way couplings."

This Provisional Specification describes a self coupling apparatus, consisting of a fixed hook and a spring hook on each end of every wagon or carriage, so placed that when the ends of two wagons meet, the spring hook upon each wagon engages into the fixed hook of the other wagon. Rods and levers are connected with the coupling, to enable it to be released, without requiring the attendant to go between the wagons.

A.D. 1874, February 26.—No. 724.

LIGHT, Charles Llewellyn, of No. 5, Great Winchester Street Buildings, in the city of London, civil engineer.—" Improvements in road and other ways, and in the preparation of blocks of wood, suitable for " such roads and ways."

Cubes of wood are bored with a central hole, and are cut from opposite sides to opposite sides of the hole, to leave distancing strips upon the blocks themselves. These blocks require no nailing to the substructure.

A.D. 1874, February 26.—No. 725.

DOVE, William, of Downham Market, in the county of Norfolk.—" A new and improved appliance to be " adapted to liquid measures to prevent spilling the contents thereof when full."

The feature of novelty of this invention consists in pivoting near the top of a liquid measure a trough or other suitable hollow vessel, so that when a measure is filled, upon turning the said trough or vessel partly down, it shall take in some of the liquid, and thus bring its level considerably below the top of the measure enabling it to be carried without spilling the contents thereof.

A.D. 1874, February 26.—No. 726.

BENTALL, Edward Hammond, of Heybridge, near Malden, in the county of Essex, agricultural implement maker.—" Improvements in the construction of root pulpers."

The object of this invention is to simplify the construction, and increase the efficiency of root pulpers. The invention applies both to band and disc pulpers. Instead of the ordinary flat steel blades, I use blades made of corrugated sheet steel.

A.D. 1874, February 26.—No. 727.

BROOKS, William, of Bennington, in the state of Vermont, United States of America.—" Improve- " ments in machines for twisting fringe on shawls and other fabrics."

Two endless feeding belts, chains, or bands, one having a row of teeth to engage with the fringe-yarns against the selvedge strip, and the other having teeth to engage with the body of the shawl or fabric, in combination with reciprocating strand dividing blades and lifters, and vibrating twisting fingers. A device by which one of the two feeding belts, chains, or bands is moved toward and from the other at each twisting operation, to lessen the tension on the strands while they are being twisted and to straighten the fringe yarns while being divided into strands. The combination of a fringe feeder, twisting fingers, strand dividing blades and lifters, and a strand guiding finger or device, whereby two strands of fringe that are separated at their ends by another strand or strands are twisted together. A vibrating doffer in combination with the toothed endless feeder, to assist in progressively discharging the twisted fringe from the feeder A flexible endless platform in combination with the endless feeder to support and carry along the bodies of the shawls or fabrics as the twisting of the fringe thereof progresses. Devices by which one of the feeding belts, chains, or bands can be adjusted at different distances from the other and in respect to the twisting devices, so as to render the machine suitable for twisting fringes of different widths.

A.D. 1874, February 26.—No. 728.

HANCOCK, John, of Holland House, Hyson Green, in the town and county of Nottingham.—"Improvements in the manufacture of knitted fabrics, and in machinery employed therein."

This Specification describes making knitted tubular goods shaped or fashioned and with a mock seam, the fashioning being a short distance away from and on each side of the seam.

Two straight opposite rows of needles are used with carriers passing around both of them; the needle for forming the mock seam is at one end. The needles are caused to rise and fall in succession, for thread to be laid on to them and to knock over the work.

When the work is to be widened this needle, with three or other number of needles of each row next to it, are shogged a distance of one needle from the others, and fresh needles are moved forward to fill in the gaps by means of pushers. A similar machine may be used to produce plain fashioned work or ribbed work. The machine is driven by a revolving shaft, as in ordinary rotary frames.

A.D. 1874, February 26.—No. 729.

MOTE, Fordham, of March, in the county of Cambridge, implement maker.—"Improvements in horse hoes."

This invention consists in grouping together in three or more lever frames placed side by side the separate or single levers hitherto employed for carrying each hoe in horse hoes. Secondly, in shortening the side frames or cheeks carrying the bar for lifting the hoe frame or frames, and in reducing the power required to lift the same.

A.D. 1874, February 26.—No. 730.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Charles H. Webb, of Brooklyn, New York, United States of America.*)—"Improvements in apparatus or machinery for charging and finishing cartridges for fire-arms, parts of which improvements are applicable to other purposes."

The said invention relates more especially to the kinds of charging machines that are adapted to the purposes of those who wish to charge cartridges for their own use. The tools heretofore in use for these purposes have been found inconvenient, and consist of many parts. The object of the said invention is to produce a machine which will be at once simple compact and easily and rapidly operated.

A.D. 1874, February 27.—No. 731.

BROWN, Joseph, of Chelsea, in the county of Middlesex, gentleman.—"Improvements in the ornamentation of vitreous, ceramic, glazed, and metallic surfaces."

The essential feature of this invention consists in ornamenting vitreous, ceramic, glazed, and metallic surfaces, by effecting the reproduction of photographic images or an impression of the same upon the before-mentioned surfaces by the employment, in conjunction with an oleaginous or fatty substance, of fusible fluxes, together with metallic oxides.

A.D. 1874, February 27.—No. 732.

PINNINGTON, Charles, of St. James's Terrace, Caledonian Road, in the county of Middlesex.—"Improvements in paving roads and ways or other surfaces."

The invention relates to improvements in the method of paving roads, ways, or other surfaces with wood, granite, and other materials, arranged and combined in such manner as to produce a road or upper surface of granite, impervious to moisture from above or below, the granite being embedded in or upon elastic materials placed on a wood flooring so as to deaden the sound caused by horses or vehicles travelling thereon.

A.D. 1874, February 27.—No. 733.

SOMERVILLE, John, of Dublin, gas engineer.—"Improvements in the method of manufacturing gas for lighting and heating, and for the apparatus used therein."

This invention relates in the first place to carbonizing coal or other material in much larger masses than is usually the case, in apparatus specially designed for the purpose, the said apparatus consisting of retorts or ovens made of fire clay or brick about twenty feet long, ten feet high, and eighteen inches wide at bottom, but tapering to one foot wide at top, with doors to open both at bottom and top, those at the bottom being so constructed as to be entirely removable if necessary on a frame or waggon, constituted so as to receive the coke when the charge is withdrawn. The retorts or ovens are set side by side upon arches that will admit of waggons or trucks passing beneath the retorts. The furnaces are placed between the retorts, and are fed with fuel from the top, and the ash pit is made sloping so that clinker or ashes may slide down into a receiver, from which it may be removed from time to time. The fire bars are made with recesses for the insertion of firebrick, which may be removed when requiring renewal. The exit pipe for the gas is at or near the top of each retort, the said pipe being led into a chamber, which also contains one extremity of the pipe leading to the condensers. The passage from one pipe to the other is sealed by a diaphragm, which is placed between them, and dips into water contained in the chamber.

From the chamber just mentioned the gas passes on to the condenser, consisting of a series of pipes of, by preference, about three or four inches in diameter, but admitting of variation to suit the requirements of the works. These pipes are connected at each end with a chamber, the gas being made to pass from chamber to chamber in a zigzag direction, together with the products of condensation, and at each chamber are received in bulk and broken up into separate streams, and again collected in bulk until the end.

The retorts or chambers are charged with coals from a waggon or waggons made to run along a tramway above them, and when charged, the lower doors or bottom being previously secured, the upper doors are closed and the coal left to distil, the gas passing off by the exit pipe to the condensers as previously described. The coals may be supplied to the waggons by a hoist or any suitable contrivance.

A.D. 1874, February 27.—No. 734.

HUGHES, Nathaniel Hobson, of Ashgrove House, in the county of Ayr, North Britain, gentleman.—" A new or improved self registering fluid or liquid measurer."

The feature of novelty which constitutes this invention is,—the arrangement or construction of the instument or apparatus.

A.D. 1874, February 27.—No. 735.

MENZIES, John, the elder of Ordic Mills, Redgorton, in the county of Perth, North Britain, shuttle manufacturer.—" Improvements in shuttles."

The feature of novelty which constitutes this invention is,—

The adjustable bridge.

A.D. 1874, February 27.—No. 736.

PALMER, Thomas Nightingale, of Dalston, London, in the county of Middlesex.—(*A communication from Pierre Adolphe Eugene Delarue, of Paris, in the Republic of France.*)—" An improved shirt-front " waistcoat."

This invention consists in a new garment composed of a plain, worked, or embroidered shirt front, opening completely like the front of a waistcoat and fastened like an ordinary shirt front with studs or buttons, and having a tab fixed at the bottom of the front, the said tab having one or more button-holes. A collar-band or collar secured in like manner by a button or stud is also provided. Two parts, each including half of the arm-hole, are fixed on each side of the front, and the back is in one single piece or in several pieces, and receives at the top the collar or band. The back has a running string or other suitable means for tightening round the waist, and is joined at the two parts above named by two seams.

My improved shirt-front waistcoat may be made to open at the back instead of in front, and may be made of any kind of white or colored material suitable for such a purpose.

A.D. 1874, February 27.—No. 737.

BELL, Matthew, of the Temple Works, Cursitor Street, in the city of London, publishers' bookbinder.—" Improvements in producing various ornamental effects on the covers of books and such like surfaces."

According to the invention the desired design is formed to project on the surface of a block or by a combination of blocks or forms, and to such surface is applied varnish or other adhesive matter which is then thereby transferred to the book cover or other such like surface, when there is applied over these parts of the book cover or such like surface a coating of fine flock of any desired color, or it may be other powder or granules or small particles such as crushed or powdered glass or metallic gelatinous or other particles according to the effect desired to to be obtained.

The excess is removed by light brushing or shaking.

A.D. 1874, February 27.—No. 738.

BRADY, Frederic Henry, of Birmingham, in the county of Warwick, hardware merchant and manufacturer.—" Improvements in apparatus for economizing fuel in fire grates."

This invention consists of apparatus to be placed at the back of the grate to diminish the fire space of the grate. It consists of a vertical frame of slightly convex bars having a curved figure in horizontal section. The said frame of bars is supported upon a horizontal projecting hollow foot or base open at front, the top of the frame of bars having a projecting covering plate which bears against the back wall of the grate. At the back of the frame of bars and near the middle thereof is a horizontal ledge or a series of pegs, upon which ledge or pegs, blocks or pieces of fire clay or fire balls alone or mixed with coal are supported. When the apparatus is in use, the fire and heated air circulate under the hollow foot or base of the apparatus to the blocks or pieces of fire clay or material on the shelf or pegs described, which are thereby highly heated and their heat gradually given out into the apartment. A vertical frame of bars hung to the inside of the front of the grate is used to prevent small coal from falling from the grate.

A.D. 1874, February 27.—No. 739.

CONISBEE, William, of Herbert's Buildings, Waterloo Road, in the county of Surrey, engineer, and **SMALE, James,** of Hayles Street, Southwark, in the same county, printer.—" Improvements in the paper cutting and feeding arrangements of printing machines."

The improvements have for object to produce a simple and efficient machine in which various sizes of sheets or portions of paper may be cut or detached from the roll, fed, and printed, the size of sheet or portion of paper being readily altered, as from time to time may be required by the adjustment of suitable change wheels, for which purpose the feeding cylinder and the printing cylinder are provided with toothed wheels, whereby these two cylinders are geared together through intermediate adjustable wheels carried by a slotted quadrant.

The paper is held taut and cut by a serrated knife which enters a space between two small rollers.

A.D. 1874, February 27.—No. 740.

MITCHELL, William, of Brandon, in the county of Suffolk.—" Improvements in obtaining motive " power."

Motive power is obtained by water falling from a tank onto a water wheel beneath, from which the water passes to one or two auxiliary water wheels placed beneath the main water wheel, and arranged, the one for the forward motion in front of and the other for reversing behind the main water wheel. The water after driving these wheels is conducted to a pump or archimedean screw by which it is raised and returned to the tank.

A.D. 1874, February 27.—No. 741.

DUNKLEY, James Henry, of Yeovil, in the county of Somerset.—" Improvements in the construction " of piano-fortes."

The feature of novelty in this invention consists in extending the sound boards of piano-fortes and fastening the top bridge thereto, thereby increasing considerably the tone and quality of the instrument.

A.D. 1874, February 27.—No. 742.

ZALKIND, Jacob, of Paris, France, now of No. 8, Southampton Buildings, London, jeweller.—" An improved device to be applied to watch-cases, lockets, and other articles of jewelry and gold and silver " smiths' work, to facilitate the opening of the same."

My said invention consists in the application of a spring or a number of springs in the interior of the hinge of the cover of the watch-case or other article, to facilitate its opening.

A.D. 1874, February 28.—No. 743.

PINFOLD, Jonathan Dumbleton, of Rugby, in the county of Warwick, engineer.—" Improvements in " machinery or apparatus to be used in brick making and stacking."

The invention relates to what is known as the " cutting machine " wherein the clay is cut into bricks by wires; and also to an appartus for lifting and stacking newly-made bricks.

A.D. 1874, February 28.—No. 744.

SAUL, Joseph, of Derby, in the county of Derby, furnace builder, and **HIRD, Holmes,** of Burton-on-Trent, in the county of Stafford, engineer.—" A new or improved method of economising fuel by " regulating the heat in the tubes of tubular steam-boilers."

The novelty in this case consists in fixing a disc or discs or a cone or cones of fire-brick in the tubes of tubular steam-boilers, so as to direct the flame and heated gases more equally upon the whole internal surface of such tubes, and thus prevent the heat escaping unutilized through the centre of the tubes.

A.D. 1874, February 28.—No. 745.

BATSTONE, William, 19, Walter Street, South Lambeth, in the county of Surrey, and **BATSTONE, Clement**, 19 Walter Street, South Lambeth, in the county Surrey.—"Improved compound for the economizing of fuel, to be used as a lining for grates, stoves, furnaces and similar purposes."

Our improved lining for stoves, grates and furnaces consists of 60 parts fire clay, 10 parts Dorsetshire white clay, 15 parts vegetable charcoal, 10 parts coke, 3 parts coal, and 2 parts cement.

A.D. 1874, February 28.—No. 746.

KENDRICK, Thomas, of Birmingham, in the county of Warwick.—"Improvements in fastenings for shirt studs, sleeve links, solitaires, and other articles of jewellery and dress."

This invention relates to improvements in fastenings for studs, links, solitaires, and other articles, whereby the two parts, that is, the "back" and "top" of the fastener is easily detachable the one from the other when desired, and great facility of adjustment is attained.

A.D. 1874, February 28.—No. 747.

PRICE, James William, of Abergavenny, in the county of Monmouth, ironmonger.—"Improved means of and appliances for producing sound signals upon railways, especially during fogs and dark weather."

One pole wire is put into connection with the pull lever of a danger signal and continued on to a distance from the station or box, where it terminates in a vertical bolt passed through a hole in the rail, the other pole wire leading from the battery to a bell.

The bolt becomes depressed intermittently by the wheels of a passing train.

A.D. 1874, February 28.—No. 748.

STEVEN, William, of Glasgow, in the county of Lanark, North Britain, brickmaker and builder.—"Improvements in brickmaking machines."

The pugmill is formed with two diametrically opposite lateral outlets at or near its bottom, and beneath each outlet there is a slide fitted to reciprocate horizontally in guides formed in the framing. Each slide is formed with two mould cavities to receive the clay, and when one is at the outlet being filled, the other is beyond it at one side or the other having the brick pushed downwards out of it by a piston or delivering plate. These delivering plates, of which there are four, are worked by heavy crossheads which are raised by cam surfaces, which may be formed or fixed on the upper side of the bevil wheel on the upper side of the bevil wheel on the pugmill shaft. When it is considered desirable to compress the clay in the moulds, pistons or plungers are for that purpose fitted to work down through the pugmill outlets. These plungers are acted on by levers on a transverse horizontal shaft which has a third lever fixed on its middle having a connecting rod jointed to it, that is acted on by a cam, crank, or eccentric on the second-motion or first-motion shaft.

A.D. 1874, February 28.—No. 749.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, engineer.—"Improvements in the means and apparatus for smelting iron."

The features of novelty are:—

Firstly.—The incorporation of the ore, fluxing materials, and the carbonaceous matter, all in a powdered state, and their consolidation into solid masses or lumps by means of hydraulic cement in the manner usually pursued in making builders' concrete or mortar.

Secondly.—The employment of this concrete, interstratified with ordinary or other fuel, in the ordinary smelting furnace, the concrete being compounded with only enough carbon to effect the reduction of the incorporated ore by the aid of the heat from the combustion of the interstratified fuel.

Thirdly.—The use of a fuel chamber external to the smelting furnace with an opening into the throat of the latter opposite the nozzle of the blast pipe, in order that coal dust or other fuel may be used to supply heat at that point in quantity easily subject to regulation, by being burned away under the impact of the blast. Bituminous coal can thus be employed to advantage.

Fourthly.—Providing this fuel chamber with a hopper head and alarum trying rod, the fall of which, as the rod descends with the burning and falling fuel, will ring a bell at the proper point, and so warn the stokers.

A.D. 1874, February 28.—No. 750.

HUGHES, George Septimus, of the city of Manchester, in the county of Lancaster.—(*A communication from Joseph Nottingham Smith, of Jersey city, in the county of Hudson and state of New Jersey, United States of America.*)—"Certain improvements in journal boxes for railroad cars."

The features of novelty which constitute my invention are, first, the combination with the frame or box containing the bearings in which the journal runs of a ball and socket joint, so connecting the said box or frame to the truck framing that the bearings may follow every motion of the axle except that of rotation, whereby certain twisting strains which cause excessive friction and consequent heating of the bearings are to a large extent avoided. Second, a lining or bearing plate fitted on its lower side for the journal to run in, and having on its upper sides ribs or projecting portions which fit into corresponding recesses in a seat which supports it, whereby it is so securely held that it may be broken or almost entirely worn out without danger of becoming displaced. Third, a removable seat for said lining which facilitates its fitting and adjustment. Fourth, a stopping-bar fitted into the box-frame which carries the aforesaid lining and provided with a bearing surface against which the end of the axle runs for preventing the excessive lateral swaying of the car on its journals. Fifth, an endless web of wool or other suitable fibrous material, the upper end of which is held against the journal by a suitable counterweight, while the lower end is immersed in oil in an oil well, whereby the journal receives a constant supply of oil; also a shaft or rod around which the said web passes and by which it may be drawn around so as to bring successive portions of it to bear on the journal as often as that portion in contact with the journal becomes worn or ineffective. Sixth, a similar web and operating devices for oiling the end of the axle. Seventh, an oil tank in which the oil is held by atmospheric pressure and only fed out in small quantities to the oil well when the oil in the latter gets below the level of the opening in the oil tank. *Eighth*, a valve attached to said oil tank which is closed by a spring when the tank is raised for refilling, whereby the spilling of the oil is avoided. *Ninth*, a packing and hinge-joint connecting the oil tank to the box frame for excluding dust from the bearing. Tenth, the combination with the stopping bar of strong wedge shaped bolts which support the stopping bar against the end thrust of the axle; and, Eleventh, a sliding cover or stop encircling the axle and closing the inner end of the box frame in which the bearings are secured to exclude dust from the bearings.

A.D. 1874, February 28.—No. 751.

TAYLOR, John Edward Hussey, of 39, Great James St., Bedford Row, in the county of Middlesex. —" Improvements in the construction of fireproof buildings."

These floors and galleries are formed of hollow metallic beams and tanks and troughs, used singly or conjointly, and are intended to contain water, either occasionally or constantly.

Where more than a single cavity is constructed, each is usually placed in free vaporous and fluid communication with the rest, and all usually have access to the outer air.

Some of the advantages possessed by this invention are—

1.—One side of all metal exposable to fire will be in contact with water.

2.—Expansion and contraction can be provided for without affecting the building.

3.—Total weight, inclusive of water, need not be greater, if so great, as that of so called fireproof structures formed of girders and brickwork.

4.—The covering surfaces of these floors under due arrangements may be soldered down or laid airtight, thus allowing any description of merchandize to be safely stored above.

5.—The proposed exterior galleries to building where space permits, not only offer secure ingress and egress during a conflagration, but enable water to be poured in on a level, and goods often removed. They also carry fire away from the walls.

6.—This invention may be utilized for various purposes, as for heating the chambers, &c. &c. &c.

A.D. 1874, February 28.—No. 752.

MALLINSÒN, James, of Welwyn, in the county of Herts.—" Improvements in steam and other " cocks."

This Provisional Specification describes constructing cocks with a plug having a way or ways through it and received into a shell in which are inlet and outlet passages as usual. A space is left all around the plug between itself and the shell except at the inlet and outlet passages where bosses or enlargements are formed which come up to the sides of the plug-packing is introduced into the space left around the plug both above and below the bosses or enlargements, by this packing the cock is maintained steam, gas, or water tight.

A.D. 1874, February 28.—No. 753.

COLES, Henry Josiah, of Devonshire Villas, Chetwynd Road, in the county of Middlesex.—" Improvements in fastenings for packing cases."

This invention relates to improvements in fastenings for packing cases, and has for its object the provision of a simple and convenient device, which is permanently attached to the box or case, so as to be always at hand, for securing the same, and which obviates the necessity for nailing down the covers of such cases, or otherwise securing them in such a manner as will occassion injury to them.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 22 to August 28, 1874. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1874, March 4.—No. 785.

GREENE, James Durrell, of 38, Southampton Buildings, Chancery Lane, London, late Brevet Brigadier General, United States Army.—"Improvements in breech-loading fire arms, and in the cartridge holders or " panniers, and means of attachment to the firearm."

This invention is for improvements in breech loading fire arms, and in the cartridge holders or panniers and means of attachment to the fire arm; and describes—

A mortice in the gun made with projecting ledges to confine the cartridge head but cut away where the head enters or is expelled; an inclination given to the apron to correct deviation of the cartridge hooks; an inclination given to the sleeve mortice to enable the sere to enter easily; a method of limiting the stroke of the spring on the firing pin, leaving the acquired momentum of the spring to carry it forward to explode the cartridge; a safety locking of the firing pin by the sere and panniers or cartridge holders open for inspection.

A.D. 1874, March 4.—No. 799.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Martin Luther Bush, of the city and state of New York, United States of America, merchant.*)—"An improved method of packing or putting-up chloride of lime."

The object of this invention is to provide a process or method for putting up chloride of lime, and consist in the manufacture of a specific quantity of chloride of lime enclosed in a kind of water-proof paper or fabric, which is not susceptible to the corrosive action of the chloride of lime, and which will prevent air or moisture reaching the same, and hence prevent the escape of the chlorine gas so offensive to the olfactory nerves.

A.D. 1874, March 5.—No. 811.

CLEGG, John, of Oldham, in the county of Lancaster, in the employ of Messieurs Asa, Lees, and Company, Limited.—"Certain improvements in self acting mules for spinning and doubling."

These improvements relate to those mules in which a rocking shaft is employed for connecting the backing off and taking in motions, and it consists in an improved combination of machinery for dispensing with the said rocking shaft, and for so connecting the backing off and taking in levers, that the taking in motion cannot commence before the backing off is completed.

A.D. 1874, March 10.—No. 867.

HUNT, Bristow, of Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from Pierre Michel Sibut, ainé, of Amiens, France, horse-shoe manufacturer.*)—"Improvements in the " manufacture of channelled or honey-combed iron, applicable for horse-shoes and for other purposes, and " in apparatus to be employed therein."

The channelled or honey-combed iron is iron rolled or swaged with alternate projections and hollows arranged according to any design, with a longitudinal border of the same or of a different height as the interior projections.

This border may be formed on one side of the iron only or on both sides.

It may be isolated from the interior projections by a straight or waved groove, or it may be of one piece therewith. The hollows or depressions may be trough-shaped, or some parts may be trough-shaped and other parts square.

This channelled or honey-combed iron is intended especially for the manufacture of horse shoes in which the channelled or honey-combed surface or face is that which rests on the ground.

The iron is made in bars or pieces, whether straight or curved, either by means of grooved cylinders or rolls cut out or moulded to the figure or design to be produced, or by swaging or stamping by means of matrices hollowed out or moulded, according to the arrangement to be produced.

A.D. 1874, August 22.—No. 2889.

JONES, John Thomas, of Ilion, in the county of Herkimer, and state of New York, in the United States of America.—" Improvements in sewing machines."

My invention relates to certain improvements in sewing-machines, and consists, firstly, in devices for operating the needle so as to impart to it a differential movement. It consists, secondly, in an improved thread-tension device; thirdly, in device for operating the feed bar and regulating the feed; fourthly, in a novel means for taking up the slack, and in a modification of the device for regulating the tension of the needle thread; fifthly, in an improved hemming device; sixthly, in a novel arrangement and construction of the treadle for operating the machine, whereby such treadle is made alternating or changeable; and seventhly, my invention consists in a novel method of constructing the table, whereby the machine may be dropped down out of the way, so as to enable the table to be used like an an ordinary table. It further consists in a peculiar construction of the hinges and fastening device for securing the hinged and sliding parts in place.

According to the first, second, and third parts of my invention, I make use of the eccentric intermediate between the revolving shaft and needle bar or arm, said eccentric intermediate receiving its motion from said shaft, and being differential in consequence of the eccentricity, and hence moving faster during part of its revolution, and slower during another part of its revolution than the motor-shaft, and this intermediate acts upon a cam upon the needle-bar or arm, so that the movement of the needle is accelerated in its upward and downward movement and pauses while in the cloth to allow the proper movement of the shuttle.

The feeding mechanism consists of a rocking shaft that communicates the reciprocation horizontally to the feeding bar, and this bar slides in a shoe connected by a screw to an arm upon the sleeve around the rock-shaft, and this arm receives motion from a cam upon the rock-shaft that drives the shuttle so as to strike the feeding-points up into the cloth at the proper time.

The thread tension is made with a clamp of peculiar character, which does not confine the two or more coils upon each other, thereby there is not any change in the tension in consequence of the last coil of the thread being partially beneath one of the other coils, as the thread is liberated from the pressure of the clamp previous to passing off toward the needle.

I will now proceed to describe the fourth part of my invention which relates to a peculiarity in the construction of the mechanism employed for taking up the slack thread and tightening the stitch. I employ a lever upon the front plate of the stationary arm. This lever is operated by a cam on the main driving-shaft and acts to take up the slack by drawing the thread off laterally between two studs or rollers of peculiar construction.

The said front plate also carries a tension mechanism, from which the thread passes to an eye or guide upon the upper end of the needle-bar. By this arrangement the thread is released from unnecessary strain when the stitch is being tightened, and there is but little lateral motion required at the eye or hook of the take up lever. The tension mechanism is provided with a two-part nut and contractible band that prevents the nut turning by the rotation of the thread-detainer, and insures uniformity of friction and prevents unequal wear, as in the split spring-nuts heretofore employed. The needle-bar is made trough shaped to obtain strength with lightness, and wear upon the same is compensated by adjustable bearing-blocks. According to the fifth part of my invention I use a fold-turner, made double, and of **U** shape, so as to be adapted to folding the fabric for the hem, or for guiding, in its centre part, a cord to be included in the hem or the edge of a piece of fabric to be bound by a strip of binding running through such folder, or for uniting a strip to the hem. The **U**-shaped turner and guide is applied to a volute-edge turner, a movable gage, and an attaching-plate, so as to be adapted to the various uses set forth.

And according to the sixth part of my invention the treadle is made for allowing the position of the feet to be changed in relation to such treadle, so that it will be operated by the foot swinging upon the ankle joint or by the rise and fall of the foot and leg, thereby the operator can bring into action different muscles of the legs or body as desired, thereby preventing too great fatigue of the person in consequence of the prolonged operation of the treadle by one character of movement. The treadles receive a rise and fall movement, and the heel pieces remain in a fixed position, hence when the foot rests upon both the heel piece and the treadle, the latter will be operated by the forward part of the foot, and the movement will be principally at the ankle joint.

When the hollow of the foot rests upon the treadle, the movement of the foot and lower limb will be nearly vertical, and there will be but little motion at the ankle.

And by a slight modification connecting the heel piece and treadle by the bent bar, the same result may be obtained.

And according to the last part of my invention which relates to a peculiar construction of the table supporting the machine, which I arrange in such a manner that the machine may be lowered inside such table, and by means of sliding and hinged leaves taking the place of the movable machine table, such table may be used for any purpose, and by a peculiar construction of the hinges, by means of which additional leaves may be hinged to such table without disfiguring the same by cutting away the moulding.

I am aware that plans have been devised for dropping the machine through or below the table, but they are such as to preclude their use from defect in their arrangement.

A.D. 1874, August 25.—No. 2903.

WRIGHT, Edmund, of Evesham, in the county of Worcester.—" Improvements in operating sewing and " other treadle machines."

Consists in two oscillating clutches fitted on a hollow spindle to drive the fly wheel, said clutches being operated alternately from the treadles. Each clutch consists of a hollow pulley operated by two belts, and containing a lever, wedge, and roller, so arranged as to alternately bite and release the hollow spindle on which the clutches are fitted, whereby continuous rotary motion is imparted to the said spindle and consequently to the band wheel.

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AND TO

APPENDIXES FROM MARCH 1 TO AUG. 28, 1874.

e names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 36 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1873, and the Appendixes Nos. 1 to 9 with the weekly Nos. of the Index for the present year.]

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ott, W., 12, Ships' boats.
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(*Daimler*), 605, Gas motor engines.
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ahams, A., 227, Evaporating perfumes, &c.
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– H. & G., 681, Door plinth for excluding wind, &c.
en, H., 57, Coking coal, &c.
— H., 576, Blast furnaces and cupolas.
ander, E. P. (*Schmid*), 1799 (*App.* 6.) Liquid meters.
n, A., 543, Fastening bale bands.
, E. F. (Lake), 80, Adjustable pulleys.
– *R. N.* (Haseltine), 2810 (*App.* 7.) Railway wheels.
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bold, G., 200, Producing aluminous compounds.
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—— (*Galland*), 678, Brewing.
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Bate, J. J. (Haseltine), 2352 (*App.* 2.) Refrigerating.
Bateman, D., & Mortimer, M., 2254 (*App.* 1.) Looms.
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—— W. & C., 745, Lining for grates, &c.
Baville, E. P. (Bonneville), 1231 (*App.* 41.) Tool-holders.
Baxter, J. C., 482, Obtaining motive-power.
Bean, E. E., 2380 (*App.* 2) Gas lighting apparatus.
Beath, J. M. G. (Benson), 2460 (*App.* 3.) Ice-making.
Beaumont, F. E. B., 392, Steering vessels.
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Beckwith, W. G. (Haseltine), 474, Sewing machines.
Belier, C. (*Roullier*), 213, Mats.
Bell, M., 737, Ornamenting book covers, &c.
Benjamin, H., 682, Extracting oleaginous matters from
[suds to produce tallow, &c.
Bennett, T. S., 129, Pickers used in weaving.
Benson, M. (*Morris, Robinson, Mackenzie & Brocchus*),
[64, Metal furnaces.
—— (*Painter*), 121, Pump valves.
—— (*Ferguson*), 426, Pipe tongs and cutters.
—— (*Rehbein, Roberts, & Brocchus*), 495, Welding
[copper.
—— (*Cope & Maxwell*), 1086 (*App.* 40.) Steam-engines.
—— (*Whitely*), 2173 (*App.* 52.) Reaping and mowing.
—— (*Beath*), 2460 (App. 3.) Ice-making.
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Berthier, S. A. L. (Bonneville), 14, Printing presses.
—— (Bonneville), 15, Copying presses.
Betteley, J., 48, Ships' propellers.
—— J. H., 686, Starting and stopping tram cars.
Beverley, W., 175, Life buoys.
Bidtel, A. (Beck), 2735 (*App.* 6.) Purifying feed water.
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——— W. Y., 408, Railway switches.
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——— B., & A. B., 507, Steam-engines.
——— T., 540, Size.
Blair, T. S. (Imray), 308, Regenerative furnaces.
Blair, T. T., 235, Anti-fouling composition for ships.
Blake, C. E., 92, Dentistry.
——— J., 396, Steam generators and safety valves.
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Blaxland, G., jun., 401, Raising sunken vessels.
Bleasby, A., & Haigh, W. B., 556, Furnaces or cupolas.
Bliss, S. B. (Clark), 2366 (*App.* 2.) Making soap bubbles.
Boëthius, E. (Gilbee), 354, Cork-cutting machines.
Boll, M., & Wacker, C. (Bonneville), 647, Ships' fenders.
Bond, J., Threlfall, R. A., & Hamer, W., 30, Polishing
[spinning rollers, &c.
Bonneville, H. A. (*Berthier*), 14, Printing presses.
——— (*Berthier*), 15, Copying presses.
——— (*Lambert*), 110, Coal pit wagons.
——— (*Leeb*), 471, Table tops.
——— (*Joly*), 518, Fire alarms.
——— (*Broux & Broux*), 644, Axle sockets.
——— (*Wacker & Boll*), 647, Ships' fenders.
——— (*De Mestre*), 683, Wiring bottles.
——— (*Devlan*), 767 (*App.* 36.) Packing journal
[boxes.
——— (*Marchand*), 1170 (*App.* 41.) Railway breaks
[and couplings.
——— (*Broux*), 1230 (*App.* 41.) Lubricating spindles.
——— (*Baville*), 1231 (*App.* 41.) Tool-holders.
——— (*Burns, Higgins & Higgins*), 1271 (*App.* 42.)
[Water-closets.
——— (*Martin*), 2536 (*App.* 4.) Spinning fibres.
Bousfield, E. T., & Howard, J., 178, Steam cultivators.
——— 331, Steam-boilers.
——— G. T. (*Manley*), 58, Rotary engines and pumps.
——— (*Smith*), 380, Electrical machines.
——— (*Ferroux*), 680, Rock drilling machines.
——— (*Heaton*), 2194 (*App.* 52.) Buttons.
——— (*De Fresne*), 2388 (*App.* 2.) Propelling ships.
Bowman, H., & Newall, R. S., 165, Muriatic acid gas.
Bown, W., 715, Horse clippers.
Box, W. W., 566, Gas.
Bradbury, G. F., and Lomax, H., 263, Sewing-machines.
Bradley, H., 586, Tell-tale money boxes.
Bradley Window Co. (Gedge), 91, Ventilating window
[sash.
Brady, F. H., 738, Saving fuel in fire grates.
Braidwood, J. F., 697, Securing the lids of retorts.
Brakell, C., 313, Weaving and cutting pile fabrics.
Bramall, S., & Groves, F., 83, Railway breaks.
Bramwell, G., 79, Restoring and dyeing hair.
Brannon, P., 1246 (*App.* 41.) Building materials.
——— 1372 (*App.* 43.) Bridge girders.
——— 1472 (*App.* 44.) Decorating slabs, panels, &c.
——— 2128 (*App.* 51.) Building materials.
Brayton, G. B. (Haseltine), 2209 (*App.* 52.) Gas-engines.
Brennan, J., 139, Teaching arithmetic.
Brewer, E. G. (*McLean*), 2629 (*App.* 5.) Clasps.
——— (*Joly*), 433, Incinerating vegetable substances
[from wool, &c.
——— (*Weedermann & Sons*), 660, Ships and propellers.
——— (*Diderichsen*), 661, Artificial butter.
Bright, R. & Newbery, J. C. (Bright), 691, Extracting
[gold.
Bright, T. (*Bright & Newbery*), 691, Extracting gold.
Broadfoot, J., 239, Pumps.
Brocchus, P. E., Morris, G. W., Robinson, J. S., &
[*Mackenzie, G. N.* (Benson), 64, Metallurgical
[furnaces.
——— *P. E., Rehbein, W. G., & Roberts, H.* (Benson),
[495, Welding copper.
Brook, E., & Wilson, A., 427, Consuming fuel in furnaces.
Brookes, W. H., 84, Pumps.
Brooks, F. W. (Everett), 500, Liquid meters.
Brooks, W., 727, Fringing fabrics.
Broux, A. & D. (Bonneville), 644, Axle sockets.
——— *D.* (Bonneville), 1230 (*App.* 41.) Lubricating
[spindles.
——— *D. & A.* (Bonneville), 644, Axle sockets.
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Brown, D., & Fulton, J. (Haseltine), 1054 (*App.* 39.)
[Sheep shears.
——— *E.* (Lake), 1421 (*App.* 4.) Rotating shaft indicators.
Brown, I., 693, Pipes for watering and irrigating.
——— J., 731, Ornamenting vitreous surfaces, &c.
Brown, J. R. (Miller), 98, Treating fatty matters.
Brown, W. Morgan- (*Keniston*), 5, Boot and shoe fastenings.
——— (*Gardner & Pocock*), 450, Boots.
——— (*Osgood*), 2875 (*App.* 8.) Composition
[for printers' rollers, &c.
Browne, A. (*Knapp*), 66, Raising sunken vessels.
Browne, A. (*Foundries & Forges Co.*), 220, Iron and steel.
——— (*Foundries and Forges Co.*), 422, Alloys of iron.
——— (*Guyer*), 2801 (*App.* 7.) Bolt and nut lock.
——— R. J., 816 (*App.* 6.) Obtaining motive-power.
Buchholz, G. A., 17, Obtaining motive-power.
Buckingham, W., 551, Heating buildings and steam-boilers.
Bucknall, F., 362, Digging roots and cultivating land.
Budenberg, A. (*Schäffer & Budenberg*), 327, Injectors.
Budenberg, C. F., & Schäffer, A. (Budenberg), 327,
[Injectors.
Bull, W., 1625 (*App.* 7.) Hand dredger or excavator.
Bullough, J., 177, Sizing and drying yarn.
Burgess, C. T. & W. J., 183, Reaping and mowing machines.
——— W. J. & C. T., 183, Reaping and mowing machines.
Burley, W., & Howes, W., 303, Carriage lamps.
Burman, A. R., & De Frece, M., 575, Perfume sprayers.
Burns, J., & Higgins, C. S. & W. B. (Bonneville), 1271
[(*App.* 42.) Water-closets.
Burton, C. C., 338, Wheels for traction engines.
Bush, M. L. (Lake), 799 (*App.* 9.), Packing chloride
[of lime.
Buss, W., & Maplesden, J., 361, Ploughs.
Butterworth, E., 228, Spinning fibrous substances.
Bywater, W., & Smith, S., 646, Spinning, &c. fibres.

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Caffall, R. M., & Thomas, A., 467, Sealing gas mains, &c.
Cain, T., 86, Hollow fire-bars.
Callender, J. A., 462, Railway signals.
Cambon & Co. (Johnson), 18, Preserving fabrics, wood, &c.
Camp, A. van, & Clark, G., 33, Pavements.
Campbell, J., & Somerville, W. C., 538, Mortar mills.
Campion, G., 498, Harrows, &c.
Cannon, T., 330, Glue.
Capon, L. J. B. (Lacaze), 287, Looms.
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——— (Clark), 70, Regulating pressure of fluids.
——— (Clark), 351, Combustion of fuel.
Cathro, J. J., Girvan, J., & Lecerf, H., 394, Ornamenting
[paper.
Cattanach, D. D. (Lake), 423, Gum, &c.
Chalk, W. H., & Chubb, G. H., 320, Safes and doors.
Chalumet, G. (Mewburn), 156, Textile fabrics.
Chamberlin, W. R. B., 54, Electro-motive-power.
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Charles, P., 353, Controlling supply of water.

n, H., 504, Finger boards of pianofortes, &c.
, H., 404, Steam pumps.
, *L.* (Clark), 480, Treating maize.
dale, I., 318, Sifting cinders.
G. H., & Chalk, W. H., 320, Safes and doors.
A. M. (*Casement*), 69, Combustion of fuel, &c.
(*Casement*), 70, Regulating pressure of fluids.
(*Rogers*), 208, Lamp black.
(*Sawyer*), 253, Electric telegraphs.
(*Morton*), 290, Propelling vessels.
(*La Grove*), 292, Mechanical toy.
(*Pelouze & Audouin*), 322, Gas-purifying.
(*Ligny*), 323, Drying and heating.
(*Allin*), 350 Cutting and screwing pipes.
(*Casement*), 351, Combustion of fuel.
(*Tracy & Lawton*), 363 Sewing-machine cabinets.
(*Goodwin*), 364, Cutting button holes.
(*Gschwind & Beberdick*), 421, Mouldings.
(*McKinley*), 438, Hoeing, &c.
(*Chiozza*), 480, Treating maize.
(*Robert*), 547, Clocks.
(*Davies*), 952 (*App.* 38.) Signal lanterns.
(*Cook*), 1019 (*App.* 39.) Preparing grain for flour.
(*Doremus*), 1410 (*App.* 43.) Springs.
(*Bliss*), 2366 (*App.* 2.) Making soap bubbles.
(*Universal Signal Light Co.*), 2390 (*App.* 2.)
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(*Miltimore, Phillips & Morris*) 2498 (*App.* 3.)
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(*Atkinson*), 2563 (*App.* 4.) Steam pumps.
E. P., 49, Teaching military drill.
G., & Van Camp, A., 33, Pavements.
J., 204, Waterproof garments.
J. L., & Standfield, J., 111, Docks and pontoons.
J. L., & Standfield, J., 202, Docks and pontoons.
J. L., & Hill, E. J., 564, Railway signalling.
W. (*Cosby*), 579, Invalid bedsteads.
(*Lo Forte & Quintaralle*), 593, Preventing shifting
[of ships' cargoes; rudders.
, A. B., 631, Washing machines.
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n, R. H., Harrison, J., & Loynd, W., 537, Air
[Pumps.
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ham, H., 309, Stripe motion of looms.
, F. C., & H., 624, Furnace doors.
— H., & F. C., 624, Furnace doors.
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., 181, Crushing and reducing baryta, cocoa, &c.
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, C. W., 651, Working slide valves.
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ee, W., & Smale, J., 739, Printing machines.
, *G.* (Lippincott), 237, Condensed milk.
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, C. C., 612, Preparing yarns and fibres.
. F. (Clark), 1019 (*App.* 39.) Preparing grain
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R. (*Cooke*), 708, Sewing machine attachments.
W. (Cooke), 708, Sewing machine attachments.

Cooper, C., 417, Working railway points.
Cope, E., & Maxwell, J. R. (Benson), 1086 (*App.* 40.)
[Steam-engines.
Coppin, W., 402, Construction of ships.
Copping, R., & Walworth, J., 2067 (*App.* 51.) Preparing
[wheat for grinding.
Corbett, A. F., 568, Artificial fuel.
Cordes, B., Suarés, S. L., & Fonsèque, D. F. (Espir),
[510, Cutting down trees.
Corkran, J. F. (*Archbald*), 87, Manures.
Cornely, E. (Gedge), 107, Embroidering machines.
Corpe, C. W., 141, Construction of concrete buildings.
Cosby, O. G. (Clark), 579, Invalid bedsteads.
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[machines.
Cotton, W., 713, Knitted fabrics.
Cox, S. G., 520, Pills.
—— W., 115, Sacks or bags.
Cracknell, H. W., 692, Sash fasteners.
Cramp, C. C., 407, Tramway apparatus.
——— C. C., 491, Tramways.
Craps, J., & Derihon, J. (*Reintjens*), 529, Non-conducting
[mastic.
Crombie, G., & Somerville, G., 365, Cutting paper, &c.
Crosland, J. S., 151, Economizing fuel, &c. in furnaces.
Crosskill, T. A., & Marshall, W., 118, Wringing and
[mangling.
Crowell, J. H. (Haseltine), 2291 (*App.* 1.) Weavers'
[harness.
Cruickshank, A. B., 89, Cleats for sailing boats.
Cunningham, D., & Douglas, A., 336, Scotch bonnets.
Curtis, F. (*Williams & Page*), 24, Lamps.
——— W. J., 502, Railway points.

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[blasting.
Daimler, G. W. (Abel), 414, Gas motor engines.
———— (Abel), 605, Gas motor engines.
Dalzell, J. B., 560, Signalling on railways.
Damkoehler, J. A. H. (Tongue), 505, Preserving meat.
Danet, G. A., & Feuillant, X. C. E., 1007 (*App.* 39.)
[Preserving food.
Dann, J. T. (*Gervais*), 530, Cooking utensils.
Dargue, W., & Ellison, G., 590, Railway signalling and
[breaks.
Davey, J., 705, Ploughs.
David, A. (Ray), 100, Producing optical illusions.
Davies, D., 88, Steam-boilers.
——— 104, Governors of steam-engines.
——— H. D., 400, Roads and roadways.
——— I., 413, Separating "black plate."
Davies, T. A. (Clark), 952 (*App.* 38.) Signal lanterns.
Davies, W. H., & Higgins, F. H. W., 640, Telegraph
[signals, &c.
Daville, R. S. (*Webster & Webster*), 2647 (*App.* 5.)
[Sewing machines.
Davis, J. W., & Strauss, L., 2560 (*App.* 4.), Fastening
[pockets.
Dawson, D., & Slater, C., 633, Dyeing.
———— T. G., & J., 1845 (*App.* 48.) Printing.
———— J., & T. G., 1845 (*App.* 48.) Printing.
Deacon, H., 163, Treating substances employed in effect-
[ing chemical decomposition of gases.
Dean, S., Smith, W. H., & Merrell, H. (Haseltine), 2001
[(*App.* 50.) Millstones.
Dearman, R., 397, Saving fuel and consuming smoke.
De Fever, C., 209, Sowing and planting.
De Frece, M., & Burman, A. R., 575, Perfume sprayers.

De Fresne, E. L. J. E. (Bousfield), 2388 (*App.* 2.) Pro-
[pelling ships.
Deiss, A. A., 147, Extracting quinine from bark.
De la Bastie, F. B. A. R., 2783 (*App.* 7.) Tempering glass.
Delalot, S. L., 302, White metal.
De la Rue, W. W., & Shaw, W. T., 311, Date indicators.
Delavigne, N. A., 56, Corkscrews.
Deléon, J., 525, Building materials, &c.
De Louvagny, Comte de Beaurepaire, 591, Alcohol.
De Mestre, A. (Bonneville), 683, Wiring bottles.
Dennis, T. H. P., 431, Water waste preventors.
Deny, L., 16, Perforating metal plates.
Derihon, J., & Craps, J. (*Reintjens*), 529, Non-conducting
[mastic.
Derry, J. D., 135, Lamp and candle holders.
Dethiou, L. H., 542, Buckles.
Devlan, P. S. (Bonneville), 767 (*App.* 36.) Packing
[journal boxes.
De Vogt, H. C., 81, Navigating the air.
De Weerd, R. van, 245, Producing motive power.
Dewynter, C. (*Lenoir*), 430, Purifying gas.
De Zuccato, E., 1078 (*App.* 40.) Producing fac-similes
[of writings, &c.
Diderichsen, E. (Brewer), 661, Artificial butter.
Dix, A. M., 582, Propelling vehicles.
Dobson, James & John (Barlow), 11, Carding wool.
—— *John & James* (Barlow), 11, Carding wool.
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[Woollen yarns.
—— G. E. & A. R., White, G., & Toon, J., 171,
[Making woollen yarns.
Doremus, W. T. (Clark), 1410 (*App.* 43.) Springs.
Douglas, A., & Cunningham, D., 336, Scotch bonnets.
Dove, W., 725, Liquid measures.
Drechsler, F. J., 133, Winnowing machines.
Dryden, J. A., & Tandy, G. G., 347, Lamps.
Dubois, E. A. (Vaughan), 246, Air-gas.
Duckett, G., & Mercer, T., 4, Size.
Dudgeon, A., 20, Utilizing heat of furnaces.
—— 22, Peat-fuel.
Duncan, J. T. (*Hunt*), 546, Precipitating metallic copper.
Dunkley, J. H., 741, Piano-fortes.
Dunlop, A., 657, Endless railways and wheels.
Dunn, W. W., 503, Drilling rock.
Dunning, G., & George, C. B. (Haseltine), 2475 (*App.* 3.)
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Dutton, S. T., 230, Railway points.
Duval, J. (Jensen), 13, Fire-arms.
Dyer, E., 328, Fire escapes.
Dyk, H. van, 199, Dressing and travelling bags.
Dyson, G. W., 122, Rolling metals, &c.

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Easton, W., & Tattersall, F., 248, Moulding bricks, &c.
Eastwood, D., 186, Looms for weaving.
Edwards, J., 384, Valves.
Edwards, S., & Erichsen, E. J. (Jensen), 138, Vats,
[gas-holders, &c.
Egerton, P., 617, Mounting spindles.
Elder, G. F., 670, Doubling fabrics.
——, H., 481, Railway breaks.
Ellis, J. E., & Redgate, E., 172, Treating hides and skins.
Ellison, G., & Dargue, W., 590, Railway signalling and
[breaks.
Emsley, S., 696, Spinning and twisting fibres.
—— S., & Peel, J., 47, Looms.
—— S., & Peel, J., 632, Looms and pickers.
Emslie, J. T., 40, Registering omnibus passengers.
Enoult, A., fils, & Varinet, J. (Abel), 184, Dressing fabrics.
Enterprise Manufacturing Co. (Hunt), 606, Hand grind-
[ing mills.
Erichsen E. J., & Edwards, S. (Jensen), 138, Vats, &c.
Espir, C. (*Suarés, Fonsèque & Cordes*), 510, Cutting
[down trees.
Essen, W. S. von, 492, Cleaning steam-boiler flues.
Everett, G. A. (*Brooks*), 500, Liquid meters.
Eyre, G., 164, Convertible school desks and seats.
Eyth, M., & Greig, D., 527, Towing machinery.

F.

Fallows, J. T., Marlow, J. B., & Roebuck, J., 274, Rail-
[way points.
Fanning, J., & Nugent, E., 191, Screws.
Farmer, J., 655, Finishing printed sheets of paper.
Farquhar, J. F. C., 112, Gas burners.
Ferguson, F. T. (Benson), 426, Pipe tongs and cutters.
Ferroux, C. (Bousfield), 680, Rock drilling machines.
Feuillant, X. C. E., & Danet, G. A., 1007 (*App.* 39.)
[Preserving food.
Fever, C. de, 209, Sowing and planting.
Finger, L., 298, Electro-magnetic annunciators.
—— 1779 (*App.* 47.) Electro-magnetic annunciators.
Fitzgerald, D. G., & Molloy, B. C., 266, White lead.
Fleming, G. S., 120, Caps for candles when burning.
Floyd, J. R. (Lake), 679, Gas-retort joints.
Folk, J. E., & Wilson, C. F. (Newton), 458, Bolsters
[and bearings for spindles.
Folliet, L., & Gally, M. (Collingridge), 374, Axle boxes.
Fonsèque, D. F., Cordes, B., & Suarés, S. L. (Espir),
[510, Cutting down trees.
Forbes, G. H., 26, Gas making.
—— 28, Fuel.
—— 34, Cements, plaster and artificial fuel.
—— 231, Purifying gas; artificial fuel.
—— 232, Purifying gas.
Ford, A., 269, Cleansing cotton waste.
—— S., 486, Actuating prime movers.
Forges & Foundries Co. (Browne), 220, Iron and steel.
—— (Browne), 422, Alloys of iron.
Forte, R. Lo, & Quintaralle, R. (Clark), 593, Preventing
[shifting of ships' cargoes; rudders.
Foster, J., & Whitaker, W., 143, Cleaning reed dents.
Fottrell, J., 77, Artificial stone pipes and tubes.
Foulis, W., 153, Charging retorts.
Foundries & Forges Co. (Browne), 220, Iron and steel.
—— (Browne), 422, Alloys of iron.
Fowlie, J. F., 2, Harness.
Fox, F. W., 82, Combing fibres.
—— T., 257, Spring mattresses.
Frankenstein, P., 484, Waterproof overcoats.
Frece, M. de, & Burman, A. R., 575, Perfume sprayers.
Fresne, E. L. J. E. de (Bousfield), 2388 (*App.* 2.) Pro-
[pelling ships.
Freund, A. L., 607, Cooking apparatus and utensils.
Friedmann, A., 373, Heating boilers of steam ships.
Fulton, J., & Brown, D. (Haseltine), 1054 (*App.* 39.)
[Sheep shears.

G.

Gaillard, L. J. P. E. (Touaillon), 519, Stopping teeth.
Galland, N. J. (Barlow), 678, Brewing.
Gally, M., & Folliet, L. (Collingridge), 374, Axle boxes.
Gardner, C. F., & Pocock, E. (Morgan-Brown), 430,
Boots.
Garton, W., 508, Treating grains or spent malt.

hot, H. (Stearns), 2819 (*App.* 8.) Match boxes.
ord, E. (Henderson), 2110 (*App.* 51.) Fire-arms.
uer, F., 321, Hydraulic mangles.
e, W. E. (*Bradley Window Co.*), 91, Ventilating [window sash.
- (*Cornely*), 107, Embroidering machines.
- (*Renard, fils.*), 130, Steam generators.
- (*Liotard, jun.*), 242, Gas burners.
ie, C. B., & Dunning, G. (Haseltine), 2475 (*App.* 3.) [Horse-shoes.
ard, F. W., 367, Purifying iron ores.
nis, A. (Dann) 530, Cooking utensils.
, W. A., 50, Drying apparatus.
n, H. W., & Sons (Jensen), 273, Wood working [machinery.
on, W., 435, Furniture castors.
e, W. A. (*Boëthius*), 354, Cork-cutting machinery.
rt, W., & Leonardt, F., 434, Pen and other boxes.
, *F. G.* (Gottheil), 25, Gas engines.
n, J., Cathro, J. J., & *Lecerf, H.*, 394, Ornamenting [paper.
ill, G. (Hunt), 700, Bottles and stoppers.
r, H., 346, Sulphuric acid.
r, J., 552, Fireproof safes.
R. S., 524, Hats.
vin, C. R. (Clark), 364, Cutting button holes.
lin, L. F., 514, Swimming jackets.
eil, R. (*Oesten*), 6, Measuring heat of fluids in pipes.
——— (*Mehl*), 21, Treating wool.
——— (*Gilles*), 25, Gas engines.
——— (*Lemmens*), 36, Dyeing warps.
——— (*Schmitt*), 757 (*App.* 8.) Knitting machines.
ing, W., 405, Furniture, &c.
erneur, J., & Hamilton, J. B., 443, Musical instru- [ments.
r, G. G. W. Sutherland-Leveson- (Duke of Suther- [land), 319, Steam cultivators.
E. (Johnson), 2646 (*App.* 5.) Transmitting [musical tones.
, H. T., & Price, C. W., 29, Railway breaks.
e, J. D., 785 (*App.* 9.), Fire arms and cartridge [holders.
er, H., 268, Glass letters and figures.
wood, A., & Keats, J. & A., 620, Sewing boots, &c.
———, J., & Pooley, H., jun., 126, Weighing ma- [chines.
, W. P., 2874 (*App.* 8.) Roller skates.
ry, H. S., 571, Seed and manure drills.
——— J., & Topping, J., 621, Cutting clay into [bricks, &c.
D., & Eyth, M., 527, Towing machinery.
, J. T. (*Austin*), 219, Wrenches.
n, R. A. (Lake), 212, Peat-fuel.
, T., 271, Coupling for driving belts.
hs, G., 602, Sewing-machine shuttles.
m, S. E., & Larer, D. (Haseltine), 1129 (*App.* 40.) [Millstones.
, *W. A. P. la* (Clark), 292, Mechanical toy.
s, F., & Bramall, S., 83, Railway breaks.
- T. B., 476, Cigarettes and cigars.
ski, F., 281, Mowing machines.
, J., 312, Umbrellas and parasols.
ind, J., & Beberdick, C. (Clark), 421, Mouldings.
J., & Williams, D., 103, Anchors.
idge, F., & Siddall, J., 243, Oil lamps.
, *I. D.* (Browne), 2801 (*App.* 7.) Bolt and nut lock.

H.

ann, W., 709, Artificial vanillin.
E. H. (*Lévy*), 301, Gas pressure indicator.

Hahn, F., 360, Compressed fuel.
Haigh, W. B., & Bleasby, A., 556, Furnaces or cupolas.
Haley, J., 722, Wire cards.
Haley, S., 616, Splitting hides or skins.
Hall, J., 468, Treating spent tan, spent hops, &c.
Hamer, W., Bond, J., & Threlfall, R. A., 30, Polishing [spinning rollers, &c.
Hamilton, J. B., 119, Musical instruments.
——— & Gouverneur, J., 443, Musical instru- [ments.
Hancock, J., 728, Knitted fabrics.
Hannam, W., & Smith, A., 562, Preparing peat.
Harfield, W. H., 310, Capstans and windlasses.
Hargreaves, J., & Robinson, T., 448, Sulphates of soda [and potassa.
Harling, G., & Whiteley, W., 244, Looms for weaving.
Harlow, B., 541, Earthenware printers' stoves.
Harmignies, A. (Johnson), 658, Steam-engines.
Harper, J., 951 (*App.* 38.) Steam and air-engines.
Harrington, J., 44, Locks or fastenings.
——— 71, Treating skins or hides.
Harris, D. (Lake), 539, Stretching boots and shoes.
Harris, J., & Judson, J., 304, Sewing machines.
Harrison, James, 383, Condensing, refrigerating, &c.
——— John, Loynd, W., & Clayton, R. H., 537, Air [pumps.
Harrison, T. W., & Richardson, A. P. (Haseltine), 1109 [(*App.* 40.) Looms.
Harrop, J. J., 485, Tin and lead piping, &c.
Hart, W. (Johnson), 358, Lowering and hoisting apparatus.
Hartley, J., & Rawsthorne, S., 62, Sizing yarns.
——— O. H., & Smith, J. H., 188, Self-acting mules.
Hartmann, G. H. J. & W., 229, Locking and unlocking [railway carriage doors.
——— W. & G. H. J., 229, Locking and unlocking [railway carriage doors.
Harvey J., & Pryer, G., 581, Ships' sails.
——— J. F., 258, Umbrellas, &c.
——— R. S., 676, Privies and earth closets.
Haseltine, G. (*Jones & Pauly*), 35, Steam-engines.
——— (*Thurston*) 96, Testing wood, iron, &c.
——— (*Beckwith*), 474, Sewing-machines.
——— G. (*McGhee & Risher*), 807 (*App.* 36.) Steam- [engines.
——— (*Hopper*), 815 (*App.* 36.) Dry gas-meters.
——— (*Meaker*), 937 (*App.* 38.) Hoistway doors.
——— (*Brown & Fulton*), 1054 (*App.* 39.) Sheep [shears.
——— (*Harrison & Richardson*), 1109 (*App.* 40.) [Looms.
——— (*Larer & Griscom*), 1129 (*App.* 40.) Millstones.
——— (*Smith*), 1219 (*App.* 41.) "Buttereine."
——— (*Read*), 1223 (*App.* 41.) Water-meters.
——— (*Isbell*), 1632 (*App.* 45.) Buttons.
——— (*Higley*), 1936 (*App.* 49.) Railway trucks and [axle-boxes.
——— (*Dean, Smith, & Merrell*), 2001 (*App.* 50.) [Millstones.
——— (*Thompson*), 2108 (*App.* 51.) Sewing machines.
——— (*Brayton*), 2209 (*App.* 52.) Gas-engines.
——— (*Walsh*), 2288 (*App.* 1.) Syringing bottles.
——— (*Baker*), 2289 (*App.* 1.) Scoop and sifter.
——— (*Crowell*), 2291 (*App.* 1.) Weavers' harness.
——— (*Bate*), 2352 (*App.* 2.) Refrigerating apparatus.
——— (*Dunning & George*), 2475 (*App.* 3.) Horse- [shoes.
——— (*Rabbeth*), 2497 (*App.* 3.) Spinning machine [spindles and bolsters.
——— (*Roach*), 2640 (*App.* 5.) Faucets.
——— (*Thurston*), 2741 (*App.* 6.) Forging, drilling [and riveting.
——— (*Allen*), 2810 (*App.* 7.) Railway wheels.
Hazeldine, F., 565, Valves or taps.

Hearson, C. E., 167, Argand burners for gas and oils.
Heaton, C., 189, Emery and other grinding machines.
——— C., 689, Emery wheels.
Heaton, D. (Bousfield), 2194 (*App.* 52.) Buttons.
Heaven, A., 446, Ornamenting woven fabrics.
Hedges, K. W., 463, Steam-boilers and engines.
Hedley, G. H. C., 123, Fire lighters.
Hellawell, H., & Norton, T., 381, Weaving velvets, &c.
Henderson, A. C. (*Gaylord*), 2110 (*App.* 51.) Fire-arms.
——— T., Thompson, W. P., & Smith, D., 569, [Supplying fuel to furnaces.
Hennuy, E. J., 703, Water-alarm.
Henry, W., 589, Carburetting hydrogen gas.
Hepworth, S. S., & Paulding, G., 1798 (*App.* 47.) Centrifugal machines.
Heywood, J. S. C., 216, Compositions for protecting the [surfaces of ships, &c.
Heyworth, E., & Smalley, W., 375, Steam-boilers.
Hickisson, J., 279, Stoppering bottles, jars, &c.
Hicks, J., 544, Saving life at sea.
Higgins, C. S., & W. B., & Burns, J. (Bonneville), 1271 [(*App.* 42.) Waterclosets.
Higgins, F. H. W., & Davies, W. H., 640, Telegraph [signals, &c.
Higgins, W. B. & C. S. & Burns, J. (Bonneville), 1271 [(*App.* 42.) Water-closets.
Higginson, A., 42, Governors.
Highton, H., 439, Electric telegraphs.
Higley, A. (Haseltine), 1936 (*App.* 49.) Railway trucks [and axle-boxes.
Hill, D., & Black, W., 173, Soda.
—— E. J., & Clark, J. L., 564, Railway signalling.
—— H. C., 341, Winding yarn and thread.
Hindley, G., 526, Cutting and dressing stone.
Hipkins, D., 664, Artificial butter.
——— D., 684, Artificial butter; purifying butter.
Hird, H., & Saul, J., 744, Saving fuel in steam-boilers.
Hirsch, J. (Johnson), 594, Applying heated air.
Hock, J., 493, Motor engines.
Holden, E., 578, Preparing fibres for combing.
——— J. & J. E., 114, Washing wool.
——— J. E. & J., 114, Washing wool.
Holland, H., 641, Gas.
Holmes, F., 68, Polishing stone, &c.
Hooker, J., 477, Setting and distributing type.
———, W. D., 203, Steam-engines and pumps.
Hopcraft, T., 372, Telegraphing in ships, hotels, &c.
Hopkinson, C., & Palmer, W., 572, Dressing flour.
——— J. T., 694, Sash fastenings.
Hopper, T. C. (Haseltine), 815 (*App.* 36.) Dry gas-[meters.
Horrocks, J., 352, Furnaces.
Howard, J., & Bousfield, E. T., 178, Steam cultivators.
——————— 331, Steam-boilers.
Howes, W., & Burley, W., 303, Carriage lamps.
Hoyle, A., & Clegg, E. A., 650, Looms.
Huerne, P., 207, Self-cleaning water filters.
Hughes, E. T. (*Libotte*), 157, Safety cages for mines, &c.
——— (*Whitney*), 628, Fire-arms.
——— G. S. (*Smith*), 750, Railway journal boxes.
——— H., 399, Ornamenting ribbons, &c.
——— N. H., 734, Measuring liquids.
Hulett, D., & Chandler, S., 1287 (*App.* 42.) Gas.
Hulme, E. J., & W., 704, Valves for motive power engines.
——— J., W., & E., 704, Valves for motive power engines.
——— W., E., & J., 704, Valves for motive power engines.
Hunt, B. (*Enterprise Manufacturing Co.*), 606, Hand [grinding mills.
—— B. (*Sibut, ainé*) 867 (*App.* 9.), Channelled iron for [horse shoes, &c.
—— E. (*Gledhill*), 700, Bottles and stoppers.
Hunt, T. S. (Duncan), 546, Precipitating metallic copper.
Hunter, A. G., 907 (*App.* 49.) Carburetting air.
Huntington, F. A., Miller, W. J., & Swingle, A., 1141 [(*App.* 40.) Fire-arms.
Hyatt, T., 432, Carriage and footways.
—— T., 478, Asbestos and its application.
Hynam, J., 615, Cigar lights, matches, and wicks.

I.

Ibbotson, H., 869 (*App.* 8.) Grinding corn.
Imhof, D., 182, Musical instruments.
Imray, J. (*Blair*), 308, Regenerative furnaces.
Ireland, A. (Johnson), 215, Rollers for spinning, &c.
Isaacs, D. M., 388, Fire escapes.
Isbell, R. H. (*Haseltine*), 1632 (*App.* 45.) Buttons.

J.

Jackson, A., & G., & Smith, J., 707, Looms.
——— G., & A., & Smith, J., 707, Looms.
Jacobsohn, S. (Johnson), 349, Polishing floors, &c.
Jaehne, E. (Abel), 1610 (*App.* 45.) Buildings.
Jensen, P. (*Duval*), 13, Fire-arms.
——— (*Erichsen & Edwards*), 138, Vats, gas-holders, &c.
——— (*Gibson & Sons*), 273, Wood working machinery.
Johnson, J., 674, Ball casters.
——— J .C., 76, Twist lace machines.
——— J. H. (*Nes*), 10, Steel.
———(*Cambon & Co.*), 18, Preserving fabrics, wood, &c.
——— (*Mousseron*), 73, Warming railway carriages.
——— (*Lamarre*), 214, Compositions for signalling [and illuminating.
——— (*Ireland*), 215, Rollers for spinning, &c.
——— (*Pollok*), 247, Shoe tips.
——— (*Jacobsohn*), 349, Polishing floors, &c.
——— (*Hart*), 358, Lowering and hoisting apparatus.
——— (*Plantrou*), 420, Carding &c. fibres.
——— (*Lissagaray*), 455, Preserving eggs.
——— (*Walker & Co.*), 475, Heckling fibres.
——— (*Hirsch*), 594, Applying heated air.
——— (*Kolbe*), 595, Acids.
——— (*Harmignies*), 658, Steam-engines.
——— (*Marrel, Brothers*), 663, Armour plates.
——— (*Miles*), 761 (*App.* 8.) Preserving eggs.
——— (*Winans*), 893 (*App.* 37.) Organ stops.
——— (*Peckham*), 1858 (*App.* 48.) Iron and steel.
——— (*Thorp*), 2100 (*App.* 51.) Cooking, lighting, &c.
——— (*Gray*), 2646 (*App.* 5.) Transmitting musical [tones.
——— S. H., 19, Sulphur.
——— S. H., 687, Furnaces and retorts.
Johnston, W., 531, Compressing air or gases.
Joly, A. (Bonneville), 518, Fire alarms.
—— *R.* (Brewer), 433, Incinerating vegetable substances [from wool, &c.
Jones, D., 1429 (*App.* 43.) Lubricating valves and [cylinders.
—— E., 194, Cartridge cases.
—— E. F., 668, Lamps.
—— J. A., 645, Window sashes.
—— J. T., 2889 (*App.* 9.), Sewing machines.
Jones, T. L., & Pauly, A. (Haseltine), 35, Steam-engines.
Joy, D., 366, Hydraulic motive-power engines.
Judson, J., & Harris, J., 304, Sewing-machines.

K.

. H., & Richardson, A. T., 387, Silk crape.
G. R., 368, Cutting or reducing meat.
, C. W. (*Schultz*), 488, Steam and other engines.
A. & J., & Greenwood, A., 620, Sewing boots, &c.
J. & A., & Greenwood, A., 620, Sewing boots, &c.
ey, J., 695, Pickers for looms.
F., 608, Railway couplings.
ll, J. L. (Lake), 701, Floor coverings.
ck, T., 746, Fasteners for studs, links, &c.
on, C. (Morgan-Brown), 5, Boot and shoe fasten,
[ings.
dy, De L., 860 (*App.* 37.) Gripping tools, punches,
[&c.
— W., 65, Supplying brushes with powder.
G., & *Adam, J.*, 638, Cutting fruit and vegetables.
, G., & Seydeler, G., 149, Distance indicators.
, J., jun., 536, Poultry fountains.
, E. C. & J. T., 259, Smoking and fumigating.
- J. T., & E. C., 259, Smoking and fumigating.
F. J., 296, Treating and separating ores.
y, I. (Marsh), 1865 (*App.* 7.) Clamping tools and
[screw wrenches.
W., 187, Shuttle tips.
ood, J. T., & Smith, W. H., 609, Carbonising
[metals.
— J. T., & Smith, W. H., 610, Treating metals.
n, J., 604, Steam-boilers.
F. & Co. (Mills), 665, Felt hats.
F., Stöffler, A., & Schmittzehe, A. (Arnheim), 597,
[Lithographic presses.
D. C., 53, Preventing incrustation in boilers.
, H. F. (Browne), 66, Raising sunken vessels.
les, J., 574, Preparing cotton and other fibres.
, H. (Johnson), 595, Acids.
S. R., 1058 (*App.* 39.) Crushing and separating
[ores.
l, C. (Vaughan), 1628 (*App.* 45.) Metallic bear-
[ings.
C. (*Wilson*), 339, Metallurgical furnaces.

L.

stie, F. B. A. R. de, 2783 (*App.* 7.) Tempering glass.
e, A. (*Capon*), 287, Looms.
rie, H. F., & Potel, H. F. E. (Wise), 2650 (*App.*
[5.) Lamps.
ty, H. W., & R., 754 (*App.* 36.) Corrugating
[cylinders.
— 755 (*App.* 36.) Centrifugal draining machines.
— R., & H. W., 754 (*App.* 36.) Corrugating
[cylinders.
— 755 (*App.* 36.) Centrifugal draining machines.
rove, W. A. P. (Clark), 292, Mechanical toy.
, J., jun., & Rutherford, W., 671, Weaving bags, &c.
, J., 174, Regulating draught in steam generators.
- W. R. (*Allen*), 80, Adjustable pulleys.
- (*Griffin*), 212, Peat-fuel.
- W. R. (*Myers*), 233, Ventilating and warming.
- (*Leighton*), 261, Lamps.
- (*Shepard & Seaman*), 278, Pails, cotton cans, &c.
- (*Maldant*), 342, Wet gas meters.
- (*Cattanach*), 423, Gum, &c.
- (*Poole*), 473, Life buoys.
- (*Harris*), 539, Stretching boots and shoes.
- (*Wilson*), 570, Paddle wheels.
- (*Perry*), 585, Hay tedding machines.

Lake, (*Floyd*), 679, Gas-retort joints.
—— (*Kendall*), 701, Floor coverings.
—— (*Sladdin*), 719, Loom harness.
—— (*Webb*), 730, Cartridges.
—— (*Bush*), 799 (*App.* 9.), Packing chloride of lime.
—— (*Brown*), 1421 (*App.* 4.) Rotating shaft indicators.
—— (*Cottingham*), 1730 (*App.* 46.) Ironing machines.
—— (*Cliff & Voce*), 2712 (*App.* 6.) Elliptic springs.
Lamarre, E. A. A. (Johnson), 214, Compositions for
[signalling and illuminating.
Lambert, D. (Bonneville), 110, Coal pit wagons.
Lamont, J., 3, Gas making.
—— J., 226, Waterclosets and cisterns.
Lancaster, J., 46, Horse-shoes.
—— T., 32, Supplying fuel to furnaces.
Langen, E. (Wirth), 2606 (*App.* 5.) Refining sugar.
Larer, D., & Griscom, S. E. (Haseltine), 1129 (*App.* 40.)
[Millstones.
La Rue, W. W. de, & Shaw, W. T., 311, Date indicators.
Latham, E., & Turton, T., 690, Transhipping cargo.
Lauth, B. C. (*Sleath*), 549, Metal rolls, pipes, wheels, &c.
Lawton, J. W., & Tracy, H. R. (Clark), 363, Sewing
[machine cabinets.
Lazenby, J., 113, Umbrellas, parasols and sunshades.
Lea, W. E., 223, Hydraulic motive-power engines.
Lebacq, F., 221, Horse-shoes.
Leber, J., 545, Cutting paper and pasteboard.
Lecerf, H., Girvan, J., & Cathro, J. J., 394, Ornament-
[ing paper.
Ledbrook, J., & Mills, J. H., 487, Railway signals.
Leeb, J. L. (Bonneville), 471, Table tops.
Leigh, E. A., 398, Carding and spinning fibres.
Leighton, C. H. (Lake), 261, Lamps.
Lemmens, A. (Gottheil), 36, Dyeing warps.
Lenoir, F. (Dewynter), 430, Purifying gas.
Lenox, G. C. L., 67, Holding chain cables.
Leon, L., 8, Fire escapes.
Leonardt, F., & Gilbert, W., 434, Pen and other boxes.
Leoni, S., 629, Heating and cooking apparatus.
Lesage, A. L. J. (Murdoch), 97, Obtaining potash.
Leveson-Gower, G. G. W. Sutherland- (Duke of Suther-
[land), 319, Steam cultivators.
Lévy, G. (Hache), 301, Gas pressure indicator.
Lewis, A. & G., 252, Trucks or barrows.
—— G. & A., 252, Trucks or barrows.
—— J. W., & Wood, G., 180, Stoves or ranges.
Libotte, N. (Hughes), 157, Safety cages for mines, &c.
Lighbody, A., & W., 523, Lamps.
—— W., 117, Lamps.
—— W., & A., 523, Lamps.
Light, C. L., 710, Railway and other wheels.
—— C. L., 724, Wooden blocks for roadways, &c.
Light Co., Universal Signal (Clark), 2390 (*App.* 2.)
[Signal lanterns.
Ligny, A. L. (Clark), 823, Drying and heating.
Liotard, C. L., jun. (Gedge), 242, Gas burners.
Lippincott, C. A. (*Conklin*), 237, Condensed milk.
Lissagaray, H. A. P. (Johnson), 455, Preserving eggs.
Lister, S. C., 280, Combustion of fuel, &c.
—— S. C., 299, Combing waste silk, &c.
Lockwood, P. E., 289, Treating beer, ale, &c.
Loewensohn, J., 162, Packing-case screws.
Lo Forte, R., & Quintaralle, R. (Clark), 593, Preventing
[shifting of ships' cargoes ; rudders.
Lomax, H., & Bradbury, G. F., 263, Sewing-machines.
Long, R., 613, Heating flat irons.
Lord, E., 146, Sizing and drying yarn.
Lothrop, H. O., 1780 (*App.* 47.) Ferrules.
Louvagny, Comte de Beaurepaire de, 591, Alcohol.
Lowe, C., 425, Separating, &c. chemical products.
—— E., 326, Artificial fuel.
Lowe, S., & White, S., 636, Railway signals.
Lowry, G., 217, Governors.

Loynd, W., Clayton, R. H., & Harrison, J., 537, Air
[pumps.
Lucas, E. F. R., 317, Anthracene.
——— T., & Clegg, T., 623, Carding engines.
Lumley, T., 403, Steam pumps.
Lynde, J. H., 532, Tramways.
Lyttle, W. A., 749, Smelting iron.

M.

McBeath, C., 601, Retorts or stills.
Mac Callan, G., 444, Reflectors.
Mc Feely, M., 522, Distilling spirits.
Mac George, I. M., 618, Regulating speed of engines.
Macgeorge, W., & McNeil, J., 51, Water tubes for boilers.
McGhee, J. H., & Risher, T. A. (Haseltine), 807
[(*App.* 36.) Steam-engines.
McInnes, J., & Steel, J., 74, Railway breaks and signals.
Macintosh, J., 234, Cigarettes.
——— J., 447, Insulating telegraph wires, &c.
——— J., 449, Roads and ways.
Mackenzie, G. N., Brocchus, P. E., Morris, G. W., &
[*Robinson, J. S.* (Benson), 64, Metal furnaces.
Mackie, S. J., 440, Signalling on trains.
McKinley, R. (Clark), 438, Hoeing, &c.
McLean, J. P. (Brewer), 2629 (*App.* 5.) Clasps for
[stays, &c.
MacLean, R., 395, Preventing railway accidents.
McMillan, D., 150, Cleaning machinery belts.
Macmillan, N., sen., 240, Finishing woven fabrics.
Macnab, W., 127, Steam-boilers.
McNeil, J., & Macgeorge, W., 51, Water tubes for boilers.
Maigron, F., 1822 (*App.* 48.) Spinning, doubling and
[twisting.
Makin, S., & Skerratt, W., 453, Spinning.
Maldant, E. C. (Lake), 342, Wet gas meters.
Mallinson, J., 752, Steam and other cocks.
Manley, W. R. (Bousfield), 58, Rotary engines and pumps.
Mann, W. T. (*Watson*), 356, Cranes.
Mansley, J., 78, Compound engines.
Manson, W., 1603 (*App.* 45.) Pneumatic hammers, &c.
Maplesden, J., & Buss, W., 361, Ploughs.
Marchand, H. E. (Bonneville), 1170 (*App.* 41.) Rail-
[way breaks and couplings.
Marchant, J., 415, Safety signals for railway points.
——— R. M., 509, Motive-power engines.
Marlow, J. B., Roebuck, J., & Fallows, J. T., 274, Rail-
[way points.
Marrel, Brothers (Johnson), 663, Armour plates.
Marsh, T. H. (*Kinney*), 1865 (*App.* 7.) Clamping tools
[and screw wrenches.
Marshall, J., 85, Thrashing machines.
——— J., 460, Portable steam-engine furnaces.
——— W., & Crosskill, T. A., 118, Wringing and
[mangling.
Martin, C. (Bonneville), 2536 (*App.* 4.) Spinning fibres.
Martin, S. B., 936 (*App.* 38.) Ice-making, &c.
Mason, T., 99, Mounting and fastening stereotype plates.
Mathieson, J., 238, Torpedoes.
Maw, A., 264, Moulding plastic materials.
Maxwell, J. R., & Cope, E. (Benson), 1086 (*App.* 40.)
[Steam-engines.
Maynes, J., 306, Turning and cutting wood, metal, &c.
Meaher, J. W. (Haseltine), 937 (*App.* 38.) Hoistway
[doors.
Mehl, E. (Gottheil), 21, Treating wool.
Meldrum, E., 559, Fire-places.
Mellard, J., Sykes, J., & Bateman, T. S., 145, Rolling
[metals.
Mellor, H. M., & Woodward, L., 632, Knitting machines.
Menzies, J., 735, Shuttles.
Mercer, T., & Duckett, G., 4, Size.
Merrell, H., Dean, S., & Smith, W. H. (Haseltine), 2001
[(*App.* 50.) Millstones.
Merriam, L. P., 370, Soldering metals.
Mestre, A. de (Bonneville), 683, Wiring bottles.
Mewburn, J. C. (*Chalumet*), 156, Textile fabrics.
Micheá, P. P. F., 284, Tannin and canocarpine.
Middleton, E. E., 409, Lengthening ships.
Miles, D. (Johnson), 761 (*App.* 8.) Preserving eggs.
Miller, J., 241, Glue.
——— J. A. (*Brown*), 98, Treating fatty matters.
——— W. J., Swingle, A., & Huntington, F. A., 1141
[(*App.* 40.) Fire-arms.
Mills, B. J. B. (*Rolland & Vanhoorde*), 635, Wheelbarrows,
——— (*Klein & Co.*), 665, Felt hats.
——— J. H., & Ledbrook, J., 487, Railway signals.
Miltimore, G. W., Phillips, M., & Morris, R. H. (Clark),
[2498 (*App.* 3.) Railway carriage axles.
Mirfield, M., & Scott, J., 573, Combing fibres.
Mitchell, W., 740, Obtaining motive power.
Mohr, C., 152, Rivetting joints and seams of boxes, &c.
Moison, T., 196, Drying textile materials, &c.
Molloy, B. C., & Fitzgerald, D. G., 266, White lead.
Molyneux, E., 61, Extracting tea.
Monckton, E. H. C., 265, Magnetic engines.
——— E. H. C., 2581 (*App.* 4.) Peat-fuel, &c.
Moore, J. W., & Norman, J., 489, Harness saddles.
Morgan-Brown, W. (*Gardner & Pocock*), 450, Boots.
——— (*Keniston*), 5, Boot and shoe fastenings.
——— (*Osgood*), 2875 (*App.* 8.) Composition
[for printers' rollers, &c.
Morrill, J., 267, Pinch bars.
Morris, C. E. D., 711, Coating metal plates.
Morris, G. W., Robinson, J. S., Mackenzie, G. N., &
[*Brocchus, P. E.* (Benson), 64, Metal furnaces.
——— *R. H., Miltimore, G. W., & Phillips, M.* (Clark),
[2498 (*App.* 3.) Railway carriage axles.
Mortimer, M., & Bateman, D., 2254 (*App.* 1.) Looms.
Morton, D., 588, Steam-boiler furnaces.
Morton, J. S. (Clark), 290, Propelling vessels.
Mote, F., 729, Horse hoes.
Mouly, F. V., 2566. (*App.* 4.) Heating and ventilating.
Mouret, L. J. N., 2699 (*App.* 6.) Model globes.
Mousseron, J. C. T. (Johnson), 73, Warming railway
[carriages.
Mueller, P. E. (Abel), 1636 (*App.* 46.) Separating silk
[rag fibres.
Muntz, P. A., & Sharp, T. B., 667, Condensing fumes in
[furnaces.
Murdoch, H. H. (*Lesage*), 97, Obtaining potash.
——— (*Picard*), 454, Treating leather.
——— (*Shaw*), 2246 (*App.* 1.) Joining and closing
[metal pipes.
Murrow, Y. J., 1063 (*App.* 39.) Waterproof plates or
[panels.
Muzzarelli, A., 324, Bleaching animal glue.
Myers, A. G. (Lake), 233, Ventilating and warming.

N.

Nangle, W. C., 557, Anti-fouling compound.
——— 1606 (*App.* 1.) Compound for coating metal, &c.
Napier, J. D., & R. D., 580, Winches, &c.
——— J. M., 131, Bottle labels.
——— R. D., & J. D., 580, Winches, &c.
Needham, W., 583, Signalling on railways.
Negretti, H., & Zambra, J. W., 109, Thermometers.
Nehrlich, H., 1873 (*App.* 48.) Producing cold and mo-
[tive power.
Nes, C. M. (Johnson), 10, Steel.
Neuhoff, W., 627, Baths.

ll, R. S., & Bowman, H., 165, Muriatic acid gas.
ery, J. C., & Bright, R. (Bright), 691, Extracting
[gold.
old, E., 385, Furnace bars.
omb, E., 2722 (*App.* 6.), Car replacer.
on, A. V. (*Sinclaire*), 205, Filtering liquids, &c.
— (*Wilbur*), 441, Metal tubing.
— (*Babbitt*), 459, Steam-boilers.
— C., & S., 677, Puddling furnaces.
— R., 106, Fire bars.
— S., & C., 677, Puddling furnaces.
— W. E. (*Phillips*), 72, Hydrate of magnesia.
— (*Stone*), 94, Electro-magnets.
— (*Stevens*), 418, Shears for cutting metal.
— (*Wilson & Folk*), 458, Bolsters and bearings for
[spindles.
lls, H. M., 41, Cutting and piling paper.
e, A., 654, Cartridges.
es, E., 332, Hop kilns.
, A., 554, Projectiles for rifled ordnance.
F. J, 291, Ratchet braces.
an, J., 169, Clipping horses.
— J., & Moore, J. W., 489, Harness saddles.
s, R. S., 132, Cutting or getting coal.
cote, G. B., jun., 445, Cleaning boots.
n, T., & Hellawell, H., 381, Weaving velvets, &c.
nt, E., & Fanning, J., 191, Screws.

O.

, G. (Gottheil), 6, Measuring heat of fluids in pipes.
shaw, H. A., 472, Boots and shoes.
. B., 517, Obtaining white pigments.
d, F. (Sawyer), 1593 (*App.* 45.) Tables.
— *J. H.* (Morgan-Brown), 2875 (*App.* 8.) Com-
[position for printers' rollers, &c.

P.

P. S. (*Todd*), 1853 (*App.* 48.) Car couplings.
P. S., & Williams, T. S. (Curtis), 24, Lamps.
R. W., 27, Actuating valves of steam engines.
T., 470, Steam ships.
er, W. (Benson), 121, Pump valves.
r, T. N., 736, Shirt-front waistcoat.
—, W., & Hopkinson, C., 572, Dressing flour.
ham, T., 285, Singeing pigs.
r, J., 7, Rolling wheel tyres.
s, F., & Pratt, F. C. (Wise), 659, Railway wheels.
on, J., 45, Capsuling bottles.
son, J. (Wichmann), 410, Railway frog for crossings.
on, G. C., 249, Fog signals and alarm bells.
ing, G., & Hepworth, S. S., 1798 (*App.* 47.) Cen-
[trifugal machines.
, A., & Jones, T. L. (Haseltine), 35, Steam-engines.
, J. H. (Whittingham), 348, Gas making.
J., 648, Weights, measures and coinage.
on, M. H., & J. T., 716, Sewing machines.
— J. T., & M. H., 716, Sewing machines.
am, E. (Johnson), 1858 (*App.* 48.) Iron and steel.
J., & Emsley, S., 47, Looms.
J., & Emsley, S., 632, Looms and pickers.
J. A., 1497 (*App.* 44.) Cutting toothed wheels and
[racks.
e, E. P., & Audouin, M. E. P. (Clark), 322, Gas.
ed, V., 516, Steam-boilers.
s, C. H., & Stowe, J. L. (Smith), 592, Clearing
[snow from tramways, &c.
T., jun., 550, Fastenings for brooches, &c.
Perry, R. G., 55, Kilns for drying peat, malt, &c.
Perry, S. (Lake), 585, Hay tedding machines.
Petrie, J., jun., 43, Washing and dyeing wool, &c.
Phillips, C. H. (Newton), 72, Hydrate of magnesia.
——— *M., Morris, R. H., & Miltimore, G. W.* (Clark),
[2498 (*App.* 3.) Railway carriage axles.
Picard, B. (Murdoch), 454, Treating leather.
Pichard, L. M., 416, Carding engines.
Pickup, J., 436, Looms for weaving.
Pilkington, E., & Addison, G., jun., 699, Safety lamps.
Pindar, A. G., & W., 125, Dressing flour, &c.
——— W., & A. G., 125, Dressing flour, &c.
Pinfold, J. D., 743, Brick making and stacking.
Pinnington, C., 732, Paving.
Piver, A., 634, Distilling oils or perfumes.
Plantrou, C. N. (Johnson), 420, Carding &c. fibres.
Pochet, H., 553, Combined bottle stopper and drinking
[vessel.
Pocock, E., & Gardner, C. F. (Morgan-Brown), 450,
[Boots.
Pollok, A. (Johnson), 247, Shoe tips.
Poole, J. T. (Lake), 473, Life buoys.
Pooley, H., jun., & Greenwood, J., 126, Weighing
[machines.
Pope, A. A. (*Quackenbush*), 2284 (*App.* 1.) Toy guns.
Post, W. H. (Talcott), 148, Screws.
Potel, H. F. E., & Lafaurie, H. F. (Wise), 2650 (*App.*
[5.) Lamps.
Poulsom, W., 52, Unloading ships' cargoes.
Pourché, A., 185, Destroying insects.
Powlett, J. A., 390, Steering apparatus for ships, &c.
Pratt, F. C., & Parsons, F. (Wise), 659, Railway wheels.
Price, C. W., & Green, H. T., 29, Railway breaks.
——— J., 2465 (*App.* 3.) Constructing vessels to facilitate
[loading.
——— J. W., 747, Sound signalling on railways.
Proctor, A., & Sanderson, S., 600, Fire-places.
Pryer, G., & Harvey, J., 581, Ships' sails.

Q.

Quackenbush, H. M. (Pope), 2284 (*App.* 1.) Toy guns.
Quin, J., 63, Protecting india-rubber valves, &c.
——— R., 496, Cigar cases.
Quintaralle, R., & Lo Forte, R. (Clark), 593, Preventing
[shifting of ships' cargoes; rudders.

R.

Rabbeth, F. J. (Haseltine), 2497 (*App.* 3.) Spinning
[machine spindles and bolsters.
Radford, J., 136, Safety valves.
Ramsden, J. C., 325, Spinning fibres.
——— J. C., 718, Spinning fibres.
Rath, F., 295, Plaited or folded fabrics.
Raoul, L. R., Comte de Beaurepaire de Louvagny, 591,
[Alcohol.
Rawsthorne, S., & Hartley, J., 62, Sizing yarns.
Ray, A. (*David*), 100, Producing optical illusions.
Read, G., 406, Bottle stoppers.
Read, H. F. (Haseltine), 1223 (*App.* 41.) Water-meters.
Redgate, E., & Ellis, J. E., 172, Treating hides and skins.
Redslob, F. A. E. (Abel), 168, Tell-tale pressure gauges.
Reed, J., 355, Boilers and furnaces.
Rehbein, W. G., Roberts, H., & Brocchus, P. E. (Benson),
[495, Welding copper.
Reintjens, L. J. (Craps & Derihon), 529, Non-conducting
[mastic.

Renard, J. F., fils (Gedge), 130, Steam generators.
Render, F., 535, Elevating grain from ships.
Rew, G. G., 300, Syphons.
Reynolds, S. (Cockings), 154, Snaps or connectors.
Reynolds, W. F., 101, Ships' compasses.
——— W. F., 515, Engine speed indicators.
Richards, J., 376, Bicarbonate of soda.
——— W., 567, Gas.
Richardson A. P., & Harrison, T. W. (Haseltine), 1109
[(*App.* 40.) Looms.
Richardson, A. T., & Kay, R. H., 387, Silk crape.
Richmond, T. & W., & Baron, J., 501, Looms.
——— W. & T., & Baron, J., 501, Looms.
Risher, T. A., & McGhee, J. H. (Haseltine), 807
[(*App.* 36.) Steam-engines.
Roach, F. (Haseltine), 2640 (*App.* 5.) Faucets.
Robert H. (Clark), 547, Clocks.
Roberts, H., Brocchus, P. E., & Rehbein, W. G. (Benson),
[495, Welding copper.
Robertson, J., 116, Indicating, &c. tram-car passengers.
Robins, W. B., 23, Hydronettes, hand pumps and syringes.
Robinson, A. H., 717, Meters and motive-power engines.
———, J., & Smith, J., 656, Shaping wood.
Robinson, J. S., Mackenzie, G. N., Brocchus, P. E., &
[*Morris, G. W.* (Benson), 64, Metal furnaces.
Robinson, T., 236, Caustic soda boiler.
——— T., & Hargreaves, T., 448, Sulphates of soda
[and potassa.
Roebuck, J., Fallows, J. T., & Marlow, J. B., 274, Rail-
[way points.
Rogers, J. (Clark), 208, Lamp black.
Rolland, N., & Vanhoorde, J. (Mills), 635, Wheel barrows.
Rose, L., 497, Stoppers for aërated liquid bottles.
Roullier, M. (Belier), 213, Mats.
Royer de la Bastie, F. B. A., 2783 (*App.* 7.) Tempering
[glass.
Rue, W. W. de la, & Shaw, W. T., 311, Date indicators.
Russell, W., 159, Ayrshire bonnets.
Ruston, J., 611, Feeding thrashing machines.
Rutherford, W., & Laird, J., jun., 671, Weaving bags, &c.
Rutter, W. F., 1495 (*App.* 44.) Combination locks.
Rydill, G., 637, Steam-boilers, furnaces, &c.

S.

Salomons, Sir D. L., 584, Indicating speed of shafts.
Sanderson, S., & Proctor, A., 600, Fire-places.
Saul, J., & Hird, H., 744, Saving fuel in steam-boilers.
Sawyer, H. (*Osgood*), 1593 (*App.* 45.) Tables.
Sawyer, W. E. (Clark), 253, Electric telegraphs.
Saxby, J., 294, Railway points and signals.
Scaife, J., 176, Packing for piston rods, &c.
Schäffer, A., & Budenberg, C. F. (Budenberg), 327
[Injectors.
Schmersahl, A. E., 160, Treating sewage water, &c.
Schmid, A. (Alexander), 1799 (*App.* 6.) Liquid meters.
Schmitt, J. (Gottheil), 757 (*App.* 8.) Knitting machines.
Schmittzehe, A., Klett, F., & Stöffler, A. (Arnheim), 597
[Lithographic presses.
Schoof, W. G., 1249 (*App.* 41.) Lever escapement.
Schultz, T. (Kayser), 488, Steam and other engines.
Scott, H. Y. D., 653, Treating sewage.
——— H. Y. D., & Spence, J. B., 283, Treating sewage, &c.
——— H. Y. D., & Williams, S. de la G., jun., 599, Kilns.
——— J., & Mirfield, M., 573, Combing fibres.
——— W. M., 712, Fire-arms.
Seaman, R., & Shepard, H. W. (Lake), 278, pails, cotton
[cans, &c.
Sellers, W., 288, Sewing machines.
Seyd, E., 377, Indicators and governors for machinery.
Seydeler, G., & Kessel, G., 149, Distance indicators.
Sharp, T. B., & Muntz, P. A., 667, Condensing fumes in
[furnaces.
Shaw, Joshua & John, jun., 155, Hoists.
——— John, jun. & Joshua, 155, Hoists.
Shaw, W. A. (Murdoch), 2246 (*App.* 1.) Joining and
[closing metal pipes.
Shaw, W. T., & De la Rue, W. W., 311, Date indicators.
Shedlock, J. J., 558, Apparatus for holding pigments,
[inks, &c.
Shepard, H. W., & Seaman, R. (Lake), 278, pails, cotton
[cans, &c.
Sherman, J. E., 464, Stoves or fire-places.
Shuttleworth, J., 437, Looms for weaving.
Sibut, P. M., aîné (Hunt), 867 (*App.* 9.), Channelled
[iron for horse shoes, &c.
Siddall, J., & Gutteridge, F., 243, Oil lamps.
Siebert, O., 622, Gas regulators.
Siemens, C. W., 428, Treating puddled balls.
Signal Light Co., Universal (Clark), 2390 (*App.* 2.)
[Signal lanterns.
Sinclaire, T. R. (Newton), 205, Filtering liquids, &c.
Singer, I. M., 698, Sewing machines.
Sival, F., 190, Lace making.
——— F., 218, Ornamental fabrics.
Skerratt, W., & Makin, S., 453, Spinning.
Sladdin, J. (Lake), 719, Loom harness.
Slater, C., & Dawson, D., 633, Dyeing.
Sleath, R. (Lauth), 549, Metal rolls, pipes, wheels, &c.
Smale, J., & Conisbee, W., 739, Printing machines.
Smalley, W., & Heyworth, E., 375, Steam-boilers.
Smith, B. (Haseltine), 1219 (*App.* 41.) "Buttereine."
Smith, A., & Hannam, W., 562, Preparing peat.
——— D., Henderson, T., & Thompson, W. P., 569,
[Supplying fuel to furnaces.
——— F. C., 386, Cutting woollen fabrics.
——— F. H., 211, Adhesive plaster.
——— G. 224, Bichromate of potash.
——— G., 345, Artificial apollinaris water.
——— G. H. (*Perkins and Stowe*), 592, Clearing snow
[from tramways, &c.
——— H., 452, Raising and lowering window blinds, &c.
Smith, H. J. (Bousfield), 380, Electrical machines.
Smith, J., & Jackson, A. & G., 707, Looms.
——— J., & Robinson, J., 656, Shaping wood.
——— J., & Vicars, T., sen., & T., jun., 669, Steam-
[boilers and furnaces.
——— J. H., 250, Sewing machines.
——— J. H., & Hartley, O. H., 188, Self-acting mules.
——— J. Mc I. (*Audouit*), 297, Medicinal plasters.
Smith, J. N. (Hughes), 750, Railway journal boxes.
Smith, R., Stephenson, W., & Vere, J., 193, Capstans.
——— S., & Bywater, W., 646, Spinning, &c. fibres.
——— W. H., & Kirkwood, J. T., 609, Carbonising metals.
——— W. H., & Kirkwood, J. T., 610, Treating metals.
Smith, W. H., Merrell, H., & Dean, S. (Haseltine), 2001
[(*App.* 50.) Millstones.
Snell, H. S., 379, Stoves.
Somerville, G., & Crombie, G., 365, Cutting paper, &c.
——— J., 733, Gas.
——— W. C., & Campbell, J., 538, Mortar mills.
Souchard, S. H., 773 (*App.* 5.) Lamps.
Spartali, N. D., 513, Fire-places and cooking stoves.
Spence, J. B., & Scott, H. Y. D., 283, Treating sewage, &c.
Spittle, W. F., & West, W., 359, Solitaires, sleeve
[links, &c.
Stacy, G., 282, Hammers.
Standfield, J., & Clark, J. L., 111, Floating docks and
[pontoons.
——— & Clark, J. L., 202, Floating docks and
[pontoons.

Stanley, W. F., 411, Circular saw bench.
——— W. F., 412, Mathematical drawing instruments.
Stearns, J. B. (*Upham*), 256, Electric telegraphs.
——— Z. B. (*Gauchot*), 2819 (*App.* 8.) Match boxes.
Steel, J., & McInnes, J., 74, Railway breaks and signals.
Stenhouse, J., 652, Purifying saccharine solutions.
Stephens, J. F., 369, Shirt fronts.
Stephenson, W., Vere, J., & Smith, R., 193, Capstans.
Sterne, L., 723, Railway couplings.
Steven, W., 748, Brick-making.
Stevens, E., 371, Breaks for vehicles and machinery.
——— W., 429, Boots and shoes.
Stevens, W. X. (Newton), 418, Shears for cutting metal.
Stewart, D., 192, Chain clips for cloth-stretching, &c.
Stüffler, A., Schmittzehe, A., & Klett, F. (Arnheim) 597, [Lithographic presses.
Stone, J. B. (Newton), 94, Electro-magnets.
Stone, R., 714, Treating iron.
Stowe, J. L., & Perkins, C. H. (Smith), 592, Clearing [snow from tramways, &c.
Strachan, J., 260, Bank cheques, &c.
Strauss, L., & Davis, J. W., 2560 (*App.* 4.) Fastening [pockets in wearing apparel.
Strong, W., & Beck, W., 424, Bricks.
Suarés, S. L., Fonsèque, D. F., & Cordes, B. (Espir) 510, [Cutting down trees.
Summerford, J. S., 335, Reclining chairs.
Sutherland, W., 31, Ornamenting glass.
Sutherland-Leveson-Gower, G. G. W. (Duke of Suther- [land), 319, Steam cultivators.
Swale, S., 340, Preserving life at sea.
Swingle, A., Huntington, F. A., & Miller, W. J., 1141 [(*App.* 40.) Fire-arms.
Sykes, J., Bateman, T. S., & Mellard, J., 145, Rolling [metals.
Synge, M. H., 254, Deodorising fluids; trapping sinks, &c.
——— M. H., 255, Fitering and purifying drainage.

T.

Talcott, C. McK. (*Post*), 148, Screws.
Tandy, G. G., & Dryden, J. A., 347, Lamps.
Tasker, S. P. M., 2203 (*App.* 52.) furnaces.
Tattersall, F., & Easton, W., 248, Moulding bricks, &c.
Tavernier, L. F., jun., 466, Felts and felted fabrics.
Taylor, E., 357, Washing machines.
——— J. E. H., 751, Fireproof buildings.
——— R., & Clegg, J., 555, Mules and twiners.
——— T., 198, Grinding or surfacing metal.
Teale, W. E., 195, Lamps.
Terrace, J. B., 630, Working steam-engine valves.
Terrey, C. A, 563, Setting diamonds in cutting tools.
Teulon, G. A., 706, Rotary engines.
Thomas, A., & Caffall, R. M., 467, Sealing gas mains, &c.
Thompson, J. G., & Webster, J. J., 393, Cleaning tram- [way tracks.
Thompson, J. J. (Haseltine), 2108 (*App.* 51.) Sewing [machines.
Thompson, N., 276, Stoppers for bottles, jars, &c.
——— N., 561, Stoppers for bottles, jars, &c.
——— W., 275, Cutting, &c. marble and stone.
——— W. P., Smith, D., & Henderson, T., 569, [Supplying fuel to furnaces.
Thornton, R., 577, Cutting corks.
Thornycroft, J. I., 382, Vessels and propellers.
Thorp, J. H. (Johnson), 2100 (*App.* 51.) Cooking, [lighting, &c.
Threlfall, R. A., Hamer, W., & Bond, J., 30, Polishing [spinning rollers, &c.
Thurston, R. H. (Haseltine), 96, Testing wood and [iron, &c.
Thurston, R. H. (Haseltine), 2741 (*App.* 6.) Forging, [drilling and riveting.
Thwaites, W. C., 483, Safety receptacle for watches, &c.
Tillman, S. D., 334, Determining musical intervals, &c.
Todd, L. J., 225, Tramway locomotives and boilers.
Todd, W. (Page), 1853 (*App.* 48.) Car couplings.
Tongue, J. G. (*Dämkoehler*), 505, Preserving meat.
Toon, J., Donisthorpe, A. R. & G. E., & White, G., 171, [Woollen yarns.
Topping, J., & Gregory, J., 621, Cutting clay into [bricks, &c.
Touaillon, C. H. (*Gaillard*), 519, Stopping teeth.
Toussaint, J., 619, Moulds for casting metals.
Townsend, S., 2217 (*App.* 52.) Endless bands.
Tracy, H. R., & Lawton, J. W. (Clark), 363, Sewing [machine cabinets.
Trueman, H. P., 643, Measuring liquids.
Truman, E. T., 124, Insulated telegraphic conductors, &c.
Turnbull, S., 170, Horse-shoes.
Turney, F. N. & J., 305, Drying or finishing glue.
——— J. & F. N., 305, Drying or finishing glue.
Turton, T., & Latham, E., 690, Transhipping cargo.
Tylor, A. & J. J., 277, Measuring and controlling liquids.
——— J. J. & A., 277, Measuring and controlling liquids.

U.

Underhay, F. G., 499, Bib cocks.
Universal Signal Light Co. (Clark), 2390 (*App.* 2.) [Signal lanterns.
Unsworth, T., 1268 (*App.* 42.) Winding and doubling [frames.
Upham, J. C. (Stearns), 256, Electric telegraphs.

V.

Van Camp, A., & Clark, G., 33, Pavements.
Van de Weerd, R., 245, Producing motive power.
Van Dyk, H., 199, Dressing and travelling bags.
Vanhoorde, J., & Rolland, N. (Mills), 635, Wheel barrows.
Van Waeyenberch, A., 1039 (*App.* 5.) Working steam [expansively.
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3. Appendix to Chronological and Descriptive Index, containing the Abridgments open to public inspection before the expiration of the term of six months, and also the Abridgments of Complete Specifications received from August 22 to August 28, 1874.
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